

**TEACHING THE WRITING PROCESS THROUGH DIGITAL STORYTELLING  
IN PRE-SERVICE EDUCATION**

A Dissertation

by

MARTHA ROBISON GREEN

Submitted to the Office of Graduate Studies of  
Texas A&M University  
in partial fulfillment of the requirements for the degree of

DOCTOR OF PHILOSOPHY

May 2011

Major Subject: Educational Psychology

Teaching the Writing Process through Digital Storytelling in Pre-service Education

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**ABSTRACT**

Teaching the Writing Process through Digital Storytelling  
in Pre-service Education. (May 2011)

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This study used a mixed-methods design to determine instructional strategies that best enhance pre-service teachers' valuing of digital storytelling as a method to teach the narrative writing process; to consider how digital storytelling increases pre-service teachers' valuing of the role of reflection in the writing process; and to explore how pre-service teachers become more aware of the relationship between words and images to convey meaning. The study also considered aspects of the project that result in pre-service teachers valuing digital storytelling to teach the writing process and investigated how engaging in a digital storytelling project helps pre-service teachers better understand the connection between the planning process in the text-based environment and the planning process in the digital environment.

Results indicated that constructing digital stories in a supportive learning environment led pre-service teachers to be more aware of the role that reflection plays in the writing process and to value digital storytelling as an effective method to teaching writing and integrate digital technology in the classroom. Participating in the project increased pre-service teachers' understanding of the connection between the planning process in the text-based environment and the planning process in the digital environment. Use of a storyboard served as a reflective planning tool that enabled pre-service teacher to better understand the connection between words and images to convey meaning and extended the planning process into the digital environment. Pre-service teachers valued the digital storytelling project as a model for teaching the writing process in the digital environment, as a method for self expression and for sharing stories within a community of learners, and as a strategy for integrating digital technology in the classroom.

## **DEDICATION**

I dedicate this dissertation to my husband, Robert Malcolm Green, with special thanks for his encouragement and support during my journey through graduate school and the writing of this dissertation, and to my children Foster Calhoun Johnson, Melissa Whittington Johnson, and Stuart Alexander Johnson.

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## 1. INTRODUCTION AND REVIEW OF LITERATURE

The quality of student writing in the United States is a major concern for educators, legislators and policymakers (Norman & Spencer 2005). The ability to communicate through writing is an essential skill for success in the educational environment and the workplace, and for participation in a democratic society. Results from the 2007 National Assessment of Educational Progress writing assessment indicate that only 33 percent of 8<sup>th</sup> grade students tested scored at or above *Proficient* with only 2 percent at *Advanced*. The 2003 National Commission on Writing in America's Schools and Colleges Report indicates that the classroom writing experience for many students is little more than filling in the blanks or giving abbreviated responses that require little thinking (Totten 2005).

Pre-service teachers in training today will in the near future be responsible for teaching in our public schools where superior writing instruction is desperately needed (Street 2003). "As national and state standards require teachers to incorporate technology into teaching, methods courses in English/ Language Arts, as well as all content areas of teacher education, must be redesigned to infuse technology into all aspects of lesson design, instruction, and assessment" (Bowman 2000, p. 98). Pope & Golub (2000) assert that teachers who use technology in their English/Language Arts classes not only improve instruction, but also change the very nature of that instruction as they engage students in innovative writing strategies that lead to reflective thinking and planning, publication, and opportunities for sharing with others both in the classroom and globally through the Internet. Hughes (2005) suggests that learning experiences grounded in content-based technology examples provide an effective method to encourage the valuing of technology.

The goal of teacher education is for pre-service teachers to be able to meaningfully use technology to support curriculum and view technology as an integral part of teaching, an effective way to deliver curriculum; not as a separate component (Robin 2006; Woodbridge 2004).

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This dissertation follows the style of *Educational Technology Research & Development*.

Effective technology integration engages students in learning and constructing knowledge through the utilization of meaningful activities that were not available before digital technology was introduced (Dexter, Anderson & Baker 1999; Trilling & Hood 1999; Sadik 2008). Digital storytelling is a transformational approach to storytelling that shifts traditional storytelling into the 21<sup>st</sup> century environment of digital technology. Digital storytelling is an adaptation of oral storytelling; it utilizes multimedia and telecommunication tools to engage students in authentic learning experiences that provide real world relevance and personal value to the learners within a situated context (Bruner 1996; Brown, Collins, & Duguid 1989; Kearney & Schuck 2006; Emihovich & Lima 1995; Lambert 2006).

Current emphasis on technology integration of state mandated and 2007 International Society for Technology Education National Educational Technology Standards (ISTE/NETS) into pre-service courses requires educational institutions to prepare pre-service teachers to be effective users of technology. The task is two-fold: providing pre-service teachers with the technology skills and also developing a valuing of technology and an understanding of how to utilize technology as a tool for learning and teaching (Collier & Veres 2006; Hughes 2005). Universities are faced with the challenge of incorporating the knowledge of technology use and meeting the expectation that educational institutions will prepare new teachers to be effective educational technology users.

According to Koehler & Mishra (2005) standards are only answer part of the question regarding technology integration. The standards outline what pre-service teachers need to know about technology, but they do not explain how they are supposed to learn it. A 1999 survey by the Milken Family Foundation and ISTE indicated teacher-training programs, in general, do not provide pre-service teachers with adequate training to prepare them to use technology effectively in the classroom. Findings indicated that formal stand- alone instructional technology coursework does not correlate well with technology skills and the ability to integrate technology into teaching. The report recommended that teacher preparation programs should increase the level of technology integration in their academic programs (Milken Exchange of Education Technology 1999). Mergendollar (1996) states, “While technological tools can spur pedagogical changes, the utility of such changes must be measured ultimately by their impact on student learning” (p. 45).

Pope, Hare & Howard (2002) agree that the knowledge and skills that pre-service teachers acquire in a basic computer course do not prepare them to integrate technology into their teaching practice. The opportunity for pre-service teachers to be exposed to new technologies while learning teaching practices in their methods courses and seeing the technologies modeled by faculty increases pre-service teachers' levels of confidence in utilizing technology (Pope et al. 2002; Adamy & Boulmetis 2006; Brown & Warschauser 2006). Teacher education programs must provide pre-service teachers with the opportunity to learn practices that allow them to integrate technology with teaching methods. "The technology experiences that pre-service teachers receive will help to determine the extent to which they use technology in the classroom" (Pope et al. 2002, p. 202).

Russell, Bebell, O'Dwyer, & O'Connor (2003) state that changing teachers' use of technology requires changing their beliefs about technology. During pre-service training, students should be exposed to a wide variety of technologies and ways to use technologies to support instructional goals. Hughes (2005) states that the ability to develop innovative technology-supported pedagogy lies in pre-service teacher' interpretation of the newly learned technology's value for supporting instruction and learning in the classroom.

## **STORYTELLING IN EDUCATION**

Storytelling is among the oldest methods of communicating ideas and learning (Mello 2001). Stories are the way in which human beings communicate meaning and construct an understanding of the world (Bruner 1996). Storytelling is a uniquely human experience that enables us to convey, through the language of words, aspects of ourselves and other, and the worlds, real or imagined, that we inhabit (McDrury & Alterio 2003). Stories are the building blocks of knowledge, the foundation of memory and learning. Stories function as symbolic tools, ways of understanding experience as unfolding in time and space (Bruner 1986). Stories serve as avenues to personal experience, and they are the way that human beings make sense of the world and create a personal reality (Schank 1990; Bruner 1987, 1991; Davis & Waggert 2006).

Bruner (1991) states that stories are about human experiences: actions, events and conflicts that occur over time. Narratives serve as a set of interpretive procedures for considering departures from norms that are meaningful in terms of established patterns of beliefs. Stories achieve meaning by explaining deviations from the expected in a comprehensible form (Bruner 1991). Creating narratives is a kind of causal thinking in which the narrator seeks to fit experiences into some form of narrative schema (Robinson & Hawpe 1986). Scholes (1981) states that a story has a specific syntactic structure: beginning-middle-end or situation-transformation-situation and must contain three basic elements: a situation that involves a conflict or predicament; an animate protagonist who engages in the situation for a purpose; and a sequence with implied causality during which the predicament is resolved (as cited in Carter 1993).

### **THE ROLE OF REFLECTION IN STORYTELLING AND WRITING**

Individuals construct stories through the process of reflection on experience (Boase 2008; McDrury & Alterio 2003; Schank 1990; Connelly & Clandinin 1990; Boud, Keogh, Walker 1985). “Meaningful storytelling processes and activities incorporate opportunities for reflective dialogue, foster collaborative endeavors, nurture the spirit of inquiry and contribute to the construction of knowledge” (McDrury & Alterio 2003). As a culturally situated, collaborative and reflective learning and teaching tool, storytelling encourages students to integrate feelings and thoughts and consider both the subjective and objective ways we make judgments about our world. Our capacity to express ourselves through narrative forms not only enables us to reshape, reassess and reconstruct particular events, it allows us to learn from discussion our experiences with individuals who may raise alternative views, suggest imaginative possibilities and ask stimulation questions (McDrury & Alterio 2003).

Storytelling serves to reinforce and magnify a student’s ability to reflect on experience and personal growth (Lathem, Reyes and Qi 2006; Linde 1993). Reflective writing includes self-assessment and pushes the writer to deeper self-knowledge (Davis & Waggert 2006). Lehr (1995) says that the heart of the writing process is reflection and revision. Through the process of writing, reflecting, and revising, the writer develops and clarifies ideas. According to Vygotsky (1978), the ability to inquire or reflect is learned by students through shared activities with peers and adults. Concepts develop and understanding

occurs when students take part in discussions and meaningful interactions with more capable peers or adults who are able to model problem solving and assist students in finding solutions. These thinking processes, which utilize psychological tools such as language, symbols, images, writing, mapping, selecting, comparing, and categorizing are internalized by the students and become part of their cognitive development (Vygotsky 1978).

### **STORY AS A MODE OF KNOWING**

Carter (1993) proposes story as a mode of knowing in contemporary research on teaching and teacher education. Carter states “story is more than simply a rhetorical device for expressing sentiments about teachers or candidates for the teaching profession. It has become a central focus for conducting research in the field” (Carter 1993, p. 5). Carter points out that expert teachers have a rich store of situated knowledge of curriculum content, classroom social processes, academic tasks, and students' understandings and intentions while novice teachers often struggle to make sense of classroom experiences. Carter indicates that this struggle with events shapes novice teachers' knowledge of teaching in fundamental ways as they write their own stories about teaching and learning. In her research, Carter attempts to understand the interpretive structures that novice teachers use to organize their knowledge of teaching through analysis of well-remembered events that occur in the school environment. According to Carter, a well-remembered event is an incident or episode that a student observes in a school situation and considers especially memorable; a short story from a novice teacher's stream of experience (Carter 1993).

### **DIGITAL STORYTELLING AS A METHOD TO CONSTRUCT KNOWLEDGE**

Digital storytelling integrates the art of storytelling with modern technology (Lathem 2005). “Digital storytelling, just like storytelling in generations past, allows individuals to share their knowledge and experiences with others by telling a story” (Behmer, Schmidt, & Schmidt 2006, p. 8). Digital storytelling is a creative, reflective, multimedia narrative edited on a computer, using still images, voice, video, music, and sound to communicate with an audience (Lambert 2005; Paull 2002). “Meaningful storytelling processes incorporate opportunities for reflective dialogue, foster collaborative endeavors, nurture the spirit of inquiry, and contribute to the construction of knowledge” (Alterio 2002, p. 3). Unlike oral stories that are subject to varying interpretations and emphasis, digital stories become permanent

artifacts that capture a specific moment in time, one telling of an experience, and stand as objects for personal reflection and critique (Lathem, Reyes, & Qi 2006).

## **USING DIGITAL STORYTELLING TO INCORPORATE TECHNOLOGY IN PRE-SERVICE EDUCATION**

Digital storytelling is an effective strategy to support student learning and the integration of technology in pre-service teacher training. Technology should serve as a supportive background for content in English/Language Arts (Shulman 1987). Teaching must build on what we know from research and practice; what we know about reading, writing, speaking, viewing and visually representing (National Council of Teachers of English, Standards, p. 1 as cited in Pope & Golub (2000). Teaching and learning English is the goal, and technology is the means through which we can reach that goal (Pope et al. 2000).

Bishop (2009) explored the use of digital and multimodal compositions to engage pre-service teachers in using digital literacy skills and to foster the construction of their teacher identities and sense of authorial agency in an elementary education language and literacy methods course. Digital literacy skills can be broadly defined as “the ability to read and interpret media (text, sound, images), to produce data and images through digital manipulation, and to evaluate and interpret new knowledge gained from digital environments” (Jones-Kavalier & Flannigan 2006, p. 8). Bishop asserts that engaging in digital and multimodal design provides “a compositional space for pre-service teachers to prepare for the authoritative discourses that they will likely encounter in schools by fostering an increased awareness of the cultural multiplicity they bring to the design and production of texts” (Bishop 2009, p. 32). Designing personal narratives using multiple modes (text, audio, still images, video) allows students to represent their thinking in ways not usually include in a literacy methods course and to reflect on differences in how these modes function regarding representation of self.

Mayer (1997) suggested that information provided both visually and verbally has a stronger impact on learning than information provided separately. When images accompany the recorded narrative, the learner performs dual coding by selecting and organizing both the visual and verbal information together in working memory to better understand the information provided (Blocker 2008). According to Bishop (2009), designing a digital story provides a literacy opportunity that extends beyond print-based



academic work. Digital stories attempt to bridge students' personal experiences with both traditional and multimodal composition with their developing ideas about how personal learning and future classroom instruction might be approached (Bishop 2009, p. 33).

Benmayor (2002) as stated in Weis, Benmayor, O'Leary, Eynon (2002) engaged students in a multicultural education class, "Latina Life Stories," in producing digital stories as a medium of empowerment, a system of representation, and as a pedagogical tool. Students read and analyzed autobiographical writings of Latina authors; then produce their own autobiographical digital stories. According to Benmayor (2002), students became more aware of individual identity and personal voice as they reacted to literature and cultural theories and constructed digital stories. Benmayor found that this was the first time for many students to consider their lives as embodying larger social forces, theories, and identities. "The digital story project provides a context for sharing experiences and an opportunity for thinking about identity, ethnicity, and culture" (Weis, et al. 2002, p. 5). Benmayor views digital storytelling as a democratic publication format that allows new voices to emerge as stories are shared with family, community audiences, and globally through Internet.

Heo (2009) examined the effects of designing a digital story on pre-service teachers' confidence about technology use and attitudes towards implementing technology in a future classroom. "Exposing pre-service teachers to effective educational technology early in their learning can have a critical impact on their long-term development toward technology efficacy" (Heo 2009, p. 410). Digital storytelling is a useful approach to multi-media based educational technology since the digital storytelling process can be learned in a relatively short time period (Lasica 2002). Pre-service teachers in this study watched a thirty minute video-based tutorial on designing a digital story using Photo Story 3. They were then asked to create a digital story over the next week responding to the prompt "Why I want to be a teachers." Results indicated that pre-service teachers' self-efficacy toward educational technology was greatly improved by participating in the digital storytelling project. In addition, the study showed that participating in the digital storytelling project advanced pre-service teachers openness to adopt new forms of educational technology. "When pre-service teachers become competent in and have an open mind toward educational technology, their likelihood of integrating technology in classrooms increases" (Heo 2009, p. 423).

Chung (2006) integrated digital storytelling into a pre-service visual arts education class as a strategy to teach contemporary visual culture and expand the technology skills and knowledge of students to teach interdisciplinary arts and humanities. According to Chung, the process of making a digital story takes arts education students beyond simply making art for its own sake. For a digital story to make sense, it must include contextual meanings to which the audience can relate.

Chung (2006) emphasized the use of the storyboard as a planning tool in the construction of a digital story. Chung stated that storyboarding is the process of visualizing how a digital story will look. Storyboarding involves planning the sequence of scenes as well as the interaction of the incorporated media components (Chung 2006, p. 40). Digital storytelling provides is an effective strategy for integrating content, teaching life issues, and for creating postmodern works of art (Chung 2006, p. 36).

Butler (2010) looked at changes in teachers' attitudes toward technology integration after completing a three day training session on developing digital stories. According to Butler (2010), the use of technology in the classroom is affected by teachers' negative attitudes toward technology and computers (Okojie & Olinzock 2006 as referenced in Butler 2010). This study used a Stages of Concern Questionnaire to measure change in teachers' attitudes over the training period. Results indicated that teachers' level of apprehension about managing the implementation of a new technology innovation in the classroom significantly declined as a result of working through the digital storytelling process in a supported workshop environment.

Blocher (2008), drawing on the work of Barrett (2007) on portfolio as story, reported on the effectiveness of digital storytelling as a performance assessment of pre-service teachers' attitudes and dispositions within an e-Portfolio system for The National Council for Accreditation of Teacher Education (NCATE) university accreditation. According to Blocker (2008), embedding digital storytelling within course instruction provided an effective strategy for students to enhance their technology skills and also afforded them an opportunity to reflect on their learning as they moved through teacher preparation courses. Interviews with faculty supplied feedback on the use of digital storytelling with pre-service teachers. Some faculty commented that digital storytelling was easy to learn, but the construction process

was time intensive. Others shared that learning more complex technology skills enabled pre-service teachers to see how they might use digital storytelling in lessons in a future classroom. Faculty also reported that the most difficult part of the digital storytelling process was topic selection and locating appropriate images. Feedback from students indicated that the digital storytelling project was both rewarding and challenging. Blocker (2008) stated “the use of this technology provided students with the opportunity to engage in a learning activity that was reported to be meaningful, satisfying and where their end product was something that they were eager to share” (Blocker 2008, p. 897).

Sadik (2008) looked at possible shifts in teachers’ technology utilization as a result of participating in training on the digital storytelling construction process using Photo Story 3 and the impact on student learning and engagement when teachers implemented the digital storytelling process in the classroom. Sadik evaluated students’ performance in digital storytelling in order to investigate students’ level of engagement in an authentic task that required them to develop, present, and share digital stories. Data obtained through interviews with teachers during and after implementation of the digital storytelling project indicated that teachers were concerned about the amount of time required to plan and prepare lessons using a storytelling approach. They were also uneasy about the quality of student work and questioned whether students were actually connecting story ideas to lesson objectives. On a positive note, teachers did indicate that constructing group digital storytelling projects “enriched the classroom learning environment, the curriculum, and the student learning experience by providing an open-ended, creative and motivating productive tool in the classroom” (Sadik 2008, p. 502). Teachers said that the digital storytelling project motivated students to use technology production tools such as computers, digital cameras, and the Internet to develop their stories.

Sadik assessed students’ projects using a Student Digital Story Evaluation Rubric (Sadik 2008, p. 500). Results indicated that students were successful with their projects and their projects met many of the pedagogical and technical criteria of digital stories; however, Sadik questioned whether students’ actually connected the point of their stories with content objectives in history, science or language arts. According to Sadik (2008), students had most difficulty with timing between the audio track and images. Findings indicated that the digital storytelling project encouraged students to consider the meaning of a story and to

clarify understanding of the topic during the process of developing the digital stories. “Students reflected on their own thoughts and engagement with the subject, both visually and aurally (Sadik 2008, p. 502).

Working with pre-service teachers in an Early Childhood Literacy Methods course, Collier and Veres (2006) investigated the impact of using the writing process to compose literacy autobiographies and design a digital story on students’ valuing of technology and the use of technology in a future classroom. Results suggest that the digital storytelling project was a positive example of embedded authentic use of technology. According to Collier and Veres (2006), students indicated that they gained an understanding about how technology can be used for learning. They commented that digital storytelling was a valuable use of technology and indicated that writing a literacy autobiography was an authentic use of their time and of technology. Students expressed concern over how to transfer the digital storytelling project into a future classroom and also mentioned that they had not seen faculty modeling similar technology or writing methods.

DeGennaro (2010) states “pre-service teachers need modeling of an engagement in constructivist practices that explicitly uses technology to support learning” (p. 339). DeGennaro asked pre-service teachers in an educational psychology class to develop digital stories, working in groups of four, to explain foundational learning theories. Students used a wiki to brainstorm ideas and to post project storyboards; then they used Photo Story 3 to construct digital stories. The intent of the assignment was to engage students in a constructivist model that utilizes technology as an integral part of learning (DeGennaro, 2010). Results indicated that student felt that the digital storytelling project connected them directly to their learning. “They saw the tools and the multimedia representations as integral to their active involvement in learning and their understanding of the concepts” (DeGennaro, 2010, p. 357). Students did express some frustrations about the open-ended nature of the assignment and the time involved in learning a new technology application.

Having pre-service teachers tell stories is an established method in English education. Tendero (2006) states that digital storytelling is emerging as a way to shape narrative. Utilizing video footage shot during a field observation, pre-service teachers were asked to select a key moment or a critical incident that was captured in the observation video and to use this experience as the subject of a digital story.

Tendero (2006) states, “With the ability to choose what becomes part of the story, as opposed to fast-forwarding past videotape of students writing quietly at their desks or throwing spit wads at a neighbor, digital storytelling can offer teacher educators a new way to shape narratives about classrooms” (p. 175). Research looked at what producing a digital story of one’s own teaching experience would mean to pre-service English teachers. According to Tendero (2006), some of the students had triumphant experiences during the semester, but other struggled all semester. Tendero pointed out that often pre-service teachers are presented with idealized stories about teaching that do not match the realities that they encounter in the classroom. Digital storytelling provided an effective means to capture real classroom experiences that led student teachers to reflect upon experience and revise practice, and develop a teaching consciousness. Developing a digital story about a teaching moment engaged students in a process of viewing, reflecting, composing and imagining versions of their identity or self as teacher. These discoveries about self are focused on new possibilities for creating narratives about future classroom practice.

Tendero (2006) points out that reflection and performance are shifted when attention is focused on both the written story and the visual narrative. The written narrative represents that student’s reflection on performance and serves as a narrative overlay in the digital story. Writing serves as a meditational process for the student, and challenges the student to become aware of various representations of self that may appear in the visual narrative. Tendero (2006) concludes that this process of facing self helps pre-service teachers to confront idealized models of educational practice.

Robin (2006) reports that digital storytelling has proven to be a solution to finding a rich technology-integrated teaching and learning model for pre-service teachers. Robin (2006) states that the goal of the teacher education program is for pre-service teachers to be able to meaningfully use technology to support their curriculum. Undergraduates were asked to develop digital stories in support of a technology-integrated unit that focused on a real-world problem that would affect the intended level of students, either global or local. Robin indicated that most students were uneasy when they were first asked to design a digital story, but by the end of the semester they commented that designing a digital story was easier than they expected. Students reported a feeling a power in their ability to plan and develop their

stories and said that they were looking forward to using the new technology skills and knowledge of digital stories with future students.

This dissertation contributes to the current knowledge about digital storytelling by examining its use with pre-service teachers as a method to teach the narrative writing process and support pre-service teachers' understanding of how to effectively combine digital technology with curriculum content in English/Language Arts.

Prior research has addressed digital storytelling as a method to increase pre-service teachers' confidence with the use of digital technology and as an approach to encourage the development of personal identity and voice. This study is important because it focuses on digital storytelling to teach the narrative writing process and reflects a systematic investigation of instructional strategies used to implement the digital storytelling project and considers the impact of these instructional strategies on pre-service teachers understanding of how to develop curriculum content using digital technology and their understanding of teaching pedagogy as a result of working on the project. The study also extends understanding of the use of a storyboard beyond visual literacy to consider the storyboard as a reflective tool to bridge the planning process from the text-based writing environment to the digital environment.

Study 1 included multiple implementations of the digital storytelling project over four semesters. The study sought to determine instructional strategies that best enhanced pre-service teachers' valuing of digital storytelling as a method to teach the writing process; to consider how digital storytelling enhances pre-service teachers' valuing of the role that reflection plays in the writing process; and to explore how pre-service teachers become more aware of the relationship between words and images to convey meaning.

Study 2 focused on the fourth semester of the digital storytelling project and considered aspects of the digital storytelling project that resulted in pre-service teachers valuing digital storytelling as a method to teach writing and support instruction and learning in the classrooms. The study also investigated how engaging in a digital storytelling project might help pre-service teachers' to better understand of the connection between the planning process in the text-based environment and the planning process in the digital environment.

## **2. TEACHING THE WRITING PROCESS THROUGH DIGITAL STORYTELLING IN PRE-SERVICE EDUCATION**

### **INTRODUCTION**

New digital technologies and multimedia are rapidly transforming how we teach, learn, and communicate both in and out of the classroom (Weis, Benmayor, O’Leary & Eynon 2002; Chung 2006). The Internet, e-mail, cell phones, pod casting, blogging, social networking sites such as *Face Book* and *Twitter* and virtual environments like *Second Life* have opened an incredible new realm of possibilities for interacting with other people, for learning about the world, and for creating personal identity and voice.

New digital technologies have the potential to transform classrooms from spaces of delivery to spaces of active inquiry where students are empowered to become researchers, storytellers, scientists, and historians (Hofer & Swan 2006; Weis, et al. 2002). Actual transformation can only occur, however, when universities provide a curriculum that prepares pre-service teachers to enter the field of education equipped to meaningfully integrate technology into practice as a tool for writing, learning, and communicating.

### **STATEMENT OF THE EDUCATIONAL ISSUE**

According to Pope, Hare & Howard (2002), a serious gap exists between what is taught in pre-service training programs and what new teachers are expected to do in the classroom. University training programs must teach pre-service teachers technology skills and also lead them to develop a valuing of technology and an understanding of how to utilize technology as a tool for learning and teaching (Collier & Veres 2006; Hughes 2005). The ability to develop innovative technology-supported pedagogy lies in pre-service teachers’ interpretation of the newly learned technology’s value for supporting instruction and learning in the classroom (Hughes 2005). Technology education in pre-service training should lead pre-service teachers to view technology as an integral part of teaching, and an effective way to deliver curriculum; not as a separate component (Pope, Hare & Howard 2002; Woodbridge, 2004).

University faculty must also be willing to model technology integration in the classroom (Bowman 2000; Chung 2006; Semich & Brown 2008). Successful technology integration will only take place when learners function as designers and computers function as mind tools, “computer applications

that when used by learners to represent what they know, engage them in critical thinking about the content they are studying (Jonassen 1996; Jonassen, Carr & Yueh 1998).

Digital storytelling is a transformational approach to storytelling that shifts traditional storytelling into the twenty-first century environment of digital technology. A digital story is a creative, reflective, multimedia narrative edited on a computer, using still images, voice, video, music, and sound to communicate with an audience (Lambert 2005; Paull 2002). As pre-service teachers construct digital stories, they apply the writing process, learn to understand the relationship between words and images to convey meaning, and come to value digital technologies as tools for teaching writing and sharing stories. Digital storytelling is a technology application that brings to teaching practice the real power of a computer as a teaching and learning tool (Leneway, Brinkley, Webb, & Harbaugh 2002).

The digital storytelling project seeks to engage pre-service teachers in learning a method to teach the writing process and infuse digital technology effectively in the language arts curriculum. This study seeks to determine instructional strategies in the digital storytelling project that will enhance pre-service teachers' ability to teach the writing process and enable them to effectively use digital technology for teaching and learning in a future classroom. Research looks at how digital storytelling enhance pre-service teachers' valuing of the role that reflection plays in the writing process and considers how pre-service teachers become more aware of the relationship between words and images to convey meaning through constructing a digital story.

### **DESIGN-BASED RESEARCH APPROACH**

Hofer & Swan (2006) advocate the development of an efficient and effective instructional model for digital storytelling through multiple implementations of similar projects in a variety of settings for a range of purposes. Wang and Hannafin (2005) define design-based research as "a systematic but flexible methodology to improve educational practices through iterative analysis, design, development and implementation, based on collaboration among researchers and practitioners in a real-world setting, and leading to contextually sensitive design and theories" (p. 6). Design-based research seeks to develop solutions to practical problems within learning environments with the goal of producing new theories,



artifacts, and educational practices (Barab & Squire 2004; Herrington, McKenney, Reeves, & Oliver 2007).

## **METHODS**

### **Introduction to the Study**

In the summer of 2007, the researcher conducted a digital storytelling workshop for in-service teachers and university faculty. Twenty-five teachers attended the workshop from across Texas. Among the participants was a faculty member in the Department of Teaching, Learning and Culture at Texas A & M University. Believing that technology is an important tool in our society, this teacher was looking for an innovative strategy that would engage pre-service teachers in learning to use digital technology within the context of the curriculum of an Early Childhood Education course. From this workshop experience, a collaboration between a practitioner and researcher began that has allowed us to explore digital storytelling as a method to teach narrative writing and lead pre-service teachers to value digital storytelling as a strategy to teach the writing process, integrate technology into the curriculum, and share stories with others over four semesters.

### **Development of Research Questions**

The first implementation of this study in fall 2007 investigated pre-service teachers' valuing of digital storytelling as a method to teach the writing process and evaluated the effectiveness of strategies used in the implementation of the digital storytelling project. The scope of the research questions was broad. The study sought to determine the educational benefit of moving from writing in a text-based format to writing in the digital environment that adds visual and auditory components to the writing process and leads students through a reflective cycle to develop an artifact that can be shared with others and also reflected on and evaluated by the author. The study looked specifically at digital storytelling as a strategy for teaching the writing process: pre-writing, drafting, reflecting, self-evaluating and revising, and publishing; enhancing an understanding of narrative structure; and developing technology skills, as well as pre-service teachers' valuing of digital technology as a teaching and learning method and their future plans to incorporate digital storytelling into classroom practice.

Subsequent implementations of the study narrowed the scope of the research and refined the research questions to focus on three specific areas of interest: instructional strategies in the digital storytelling project; the role that reflection plays in the writing process; and the relationship between words and images to convey meaning.

1. What instructional strategies in a digital storytelling project best enhance pre-service teachers' valuing of digital storytelling as a method to teach the writing process?
2. How does digital storytelling enhance pre-service teachers' valuing of the role that reflection plays in the writing process?
3. Through constructing a digital story, how do pre-service teachers become more aware of the relationship between words and images to convey meaning?

### **The Research Design**

The study used a design-based, mixed- methods research paradigm and included multiple implementations of the digital storytelling project over four semesters in an effort to improve instructional strategies and refine evaluation methods. Each implementation of the study is reported separately in order to discuss the rationale for changes in instructional strategies and modifications to evaluation methods used to assess the impact of the project on pre-service teachers that took place as a result of review at the conclusion of each semester as reported in Appendix 1 Implementation Procedures and Rationale for Change.

### **Description of the Study**

The purpose of this four semester study is to determine instructional strategies in a digital storytelling project that best enhance pre-service teachers' valuing of digital storytelling as a method to teach the writing process; to consider how digital storytelling enhances pre-service teachers' valuing of the role that reflection plays in the writing process; and to explore how pre-service teachers' become more aware of the relationship between words and images to convey meaning. The research took place in a naturalistic setting, the classroom. The two class sections remained intact. All students received the same intervention as the researcher wanted to understand changes that might occur in the attitudes of individual students due to the introduction of the digital storytelling project; not group differences. The researcher

took the role of participant/observer during the digital storytelling project which allowed for interaction with all participants during the writing phase and the digital story construction process and for viewing all completed digital artifacts.

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### **Participants in the Study**

Participants in the study, as shown in Table 1, Participants in the digital storytelling project over four semesters, were pre-service teachers enrolled in two sections of a writing intensive Early Childhood Education course: *Teaching Reading through Children's Literature* at Texas A&M University over four semesters. The majority of these students were junior and senior pre-service elementary teachers, although some students were secondary social studies or English majors. A significant majority of the pre-service teachers were female with an age range from 20 – 25.

**Table 1** Participants in the digital storytelling project over four semesters

Semester	Section 1	Section 2	N
Fall 2007 (first implementation)	M= 1 F= 31	M= 0 F= 39	71
Spring 2008 (second implementation)	M= 1 F= 22	M= 1 F= 38	62
Fall 2008 (third implementation)	M= 1 F= 32	M= 0 F= 34	67
Spring 2009 (fourth implementation)	M= 0 F= 34	M= 1 F= 31	66
Totals	M= 3 F= 119	M= 2 F= 142	266

## Data Sources

Data sources in this study as reported in Table 2, Data sources in the digital storytelling project over four semesters, were reviewed at the end of each semester and modified by the researcher as needed to better assess the impact of the digital storytelling project on pre-service teachers.

**Table 2** Data sources in the digital storytelling project over four semesters

Fall 2007	Spring 2008	Fall 2008	Spring 2009
<p>Likert Scale Attitude Survey Pre-post Test (Appendix 2-1)</p> <p>Individual interviews (7 participants)</p>	<p>Likert Scale Attitude Survey Pre-post Test Revised (Appendix 2-2)</p> <p>Pre-post Implementation Survey Pre-implementation</p> <ol style="list-style-type: none"> <li>1. Describe your experience level with technology in terms of previous training and knowledge of specific software applications.</li> <li>2. Explain the planning process that you use when you approach a writing assignment.</li> <li>3. Why is it important to integrate technology training into pre-service education?</li> </ol> <p>Post-implementation</p> <ol style="list-style-type: none"> <li>1. Describe the planning process that you used to design your digital story.</li> <li>2. How did the digital storytelling process help you to better understand story structure?</li> <li>3. Discuss how you anticipate using digital storytelling with students in a classroom.</li> </ol> <p>Individual interviews (8 participants)</p>	<p>Experience with Digital Technology Applications Survey (Appendix 7)</p> <p>Likert Scale Attitude Survey Pre-post Test (Appendix 2-2)</p> <p>Implementation Survey Pre-implementation</p> <ol style="list-style-type: none"> <li>1. Describe the planning process that you use when you are working on a writing assignment.</li> <li>2. Why is it important to integrate technology training into pre-service education?</li> </ol> <p>Post-implementation</p> <ol style="list-style-type: none"> <li>1. Describe the planning process that you used to design your digital story.</li> <li>2. How did the use of a storyboard support your thinking as you combined your narrative with images?</li> <li>3. How do you anticipate using digital storytelling with students in a classroom?</li> </ol> <p>Individual interviews (6 participants)</p>	<p>Experience with Digital Technology Applications Survey (Appendix 7)</p> <p>Likert Scale Attitude Survey Pre-post Test Revised (Appendix 2-3)</p> <p>Pre-post Implementation Survey Pre-implementation</p> <ol style="list-style-type: none"> <li>1. Describe the planning process that you use when you are working on a writing assignment.</li> <li>2. Why is it important to integrate technology training into pre-service education?</li> </ol> <p>Post-implementation</p> <ol style="list-style-type: none"> <li>1. Describe the planning process that you used to design your digital story.</li> <li>2. How did the use of a storyboard support your thinking as you combined your narrative with images?</li> <li>3. Discuss how you anticipate using digital storytelling with students in a classroom</li> </ol> <p>Individual interviews (12 participants)</p> <p>Reflection Questions</p> <ol style="list-style-type: none"> <li>1. What did telling your digital story mean to you?</li> <li>2. How did engaging in the digital storytelling project change the way you feel about teaching the writing process?</li> </ol> <p>Field notes</p>

### **Program Description**

The course is a one-semester introduction to children's literature designed to prepare pre-service teachers in Early Childhood Education to teach critical reading, language arts, and children's literature. The course is project-based and emphasizes both competent writing skills and effective methods to teach writing to early childhood - 4<sup>th</sup> grade students. The digital storytelling project was the culminating project of the semester. The project draws on knowledge from prior projects: picture story books and oral storytelling methods, literary elements and narrative structure, and the reading/writing workshop process. The digital storytelling project shifted the application of this prior content knowledge into the digital writing environment and engaged pre-service teacher in the development of a meaningful project that integrates digital technology with narrative writing and demonstrates how digital technology can be effectively utilized in the classroom. The digital storytelling project took place over a four week period. The practitioner and the researcher worked with students in class and by e-mail to help them with story topic selection and with editing the written narrative. The practitioner and the researcher also assisted students with the construction and publication of the digital story in the computer lab during the production phase of the digital stories.

The narrative writing task asked students to compose a 200-500 word personal narrative, in first person, active voice, about a meaningful personal experience. A personal narrative is considered to include a beginning-middle-end or situation-transformation-situation and contain three basic elements: a situation that involves a conflict or predicament; an animate protagonist who engages in the situation for a purpose; and a sequence with implied causality during which the predicament is resolved (Scholes 1981 as cited in Carter 1993).

The digital storytelling assignment as stated in the course syllabus:

You will be required to author a script (250-500 words maximum) and create a digital story/movie of your script using pictures, photographs, or another visual medium. Special attention will be given to your use of voice, purpose and audience as well as the literary elements (plot, setting, characterization, conflict, author's style, and theme).

The personal narrative is recorded in the student's own voice; then combined with images, video, and music to create a digital story using Windows Movie Maker. We define a digital story as a short, reflective, multimedia narrative edited on a computer, using still images, voice, video, music, and sound to communicate with an audience (Lambert 2005; Paull 2002).

Implementation of the digital storytelling project used the writing workshop model, an interactive classroom writing approach that allows students to pre-write, draft, revise, edit, and publish their writing (Atwell 1987, 1998; Tompkins 2007). The writing process as an instructional method shifts the emphasis from the students' finished product to what they think and do as they write (Tompkins, 2007). Writing is viewed as a reflective process. Characteristics of the writing workshop method include: use of the writing process; in class time for drafting, writing, and revising; in class conferencing between teacher and students; use of mini lessons (5-7 minutes) to present and model instruction; sharing writing with other students; and peer editing (Atwell 1987; Tompkins 2007). Pre-service teachers in both sections had experience with the writing workshop method prior to the digital storytelling project.

## **FIRST IMPLEMENTATION (FALL 2007)**

### **Procedure**

A Likert Scale Attitude Survey, as shown in Appendix 2-1, was administered in class at the start and conclusion of the digital storytelling project. During the first two class periods, the practitioner showed examples of digital stories, discussed the elements of digital storytelling, and demonstrated the technology required to record the narrative and construct and publish a digital video. Pre-service teachers received a rubric that laid out the requirements for the digital storytelling project as shown in Appendix 3. This rubric was used by the practitioner at the end of the project to evaluate the digital stories as they were shown in class. Pre-service teachers also received a one page handout, designed by the researcher, which explains how to construct and publish a digital story, *Making a Digital Video in Windows Movie Maker* as shown in Appendix 4. Students worked in class to determine a story idea using the writing workshop process and conferenced with the practitioner and the researcher to refine story ideas.

A story telling circle is a meaningful part of the digital storytelling process to allow participants to share initial stories and receive feedback from others (Lambert 2006). Due to time constraints, the researcher and the practitioner devised a “virtual storytelling circle” on the class website. Pre-service teachers were required to post a story idea to the class website. Using peer review techniques, each student was required to provide feedback to two postings with suggestions and comments about the story topic as a guide to the author. Next, pre-service teachers were asked to write a 200-500 word personal narrative in first person, present tense about a meaningful personal experience. This personal narrative is the basis for the digital story. Pre-service teachers were also asked to locate appropriate images, video clips, and music to illustrate the story. Students were provided with a storyboard template to use as a planning tool, but using the storyboard template was optional. The practitioner and the researcher conferenced with pre-service teachers in class and by e-mail to help students edit and refine their stories.

Recording the personal narrative using Audacity, a free software program for capturing and editing audio, was the next step in the digital construction process. The recorded narrative established the digital framework for story. Students had the opportunity to record the narrative during class time in a separate room to provide privacy. The researcher and the practitioner facilitated the recording process to reduce stress and allow students to concentrate on using voice effectively in the recording. The recorded narrative was combined with images, video, and music to create a digital story using Windows Movie Maker.

Students spent four class periods conferencing with the practitioner and the researcher, editing the written narrative, recording the audio track, and putting the digital story together; then publishing the digital artifact. The final two class periods were used to show the digital artifacts in the classroom setting and share the stories with an audience.

## **Results**

### **Likert Scale Attitude Survey**

The Likert Scale Attitude Survey for Fall 2007, as shown in Appendix 2-1, posed twenty-five questions to investigate five constructs of interest related to digital storytelling: (1) self-regulation (2) the writing process (3) computers and digital technology (4) stories (5) digital storytelling. Responses to the

Likert survey were on a 1-5 scale with the value of 1 corresponding to complete disagreement and value of 5 corresponding to complete agreement.

A paired sample t-test evaluated whether there was a change in students' attitudes due to the implementation of the digital storytelling project. Results indicated an overall statistically significant increase in the mean difference in students' attitudes. The post-test mean ( $M = 94$ ,  $SD = 7.99$ ) was significantly greater than the pre-test mean ( $M = 90.20$ ,  $SD = 8.87$ ),  $t(34) = -3.27$ ,  $p < .05$ . The standardized effect size index,  $d$  was .5, a medium effect size. The 95% confidence interval for the mean difference between the two ratings was -6.16 to -1.44.

To evaluate the effectiveness of the Likert Scale Attitude Survey, an exploratory factor analysis was conducted on the post-test data to determine latent dimensions underlying the measurement instrument. The Principal Axis Factoring extraction method was used. An un-rotated factor analysis showed nine Eigenvalues greater than 1.0 indicating that there were nine possible factors; however, based on the scree plot, the researcher determined to conduct a three factor confirmatory analysis of the data.

A three factor rotated orthogonal factor analysis was conducted using the Varimax method. The rotated factor matrix yielded three factors, but the factors were not clearly interpretable when compared with the Likert scale survey questions.

### **Individual interviews**

Individual interview were conducted with pre-service student at the conclusion of the digital storytelling project. The researcher invited all students in both classes to participate in interviews related to the digital storytelling project. Interviews used a semi-structured script to provide consistency in data collection as shown in Appendix 6. Interview questions focused on differences that students experienced when they moved from writing in a text-based format to writing in the digital environment. Specific areas of interest in the interview script included prior experience with digital technology applications, the planning process, instructional strategies used in the digital storytelling project, understanding of the relationship between words and images to convey meaning, and plans for using digital storytelling in the classroom. During the first implementation of the digital storytelling project, seven female students volunteered to participate in the interview process.



### ***Experience with digital technology***

Interview data indicated that most pre-service teachers had some prior experience with digital technology applications such as Microsoft Word, PowerPoint and Excel; however, students indicated that they learned these skills in high school. One student stated that she was very proficient with PowerPoint and always volunteers in group projects to put the presentation together. She also mentioned that she has taught herself to use Adobe Photoshop. Another student commented that she used Audacity to record voice samples for another class, but none of these pre-service teachers had ever produced a digital video.

I didn't know how to do anything, except to type. But like going to a web-site and downloading things, I have never done that. I have used a scanner. I do have one at home, but I have not used it to scan photos.

I have never made a video. When I was little, we used to record on a tape recorder, but never into a microphone, much less into a computer. I had scanned like two pictures years ago, but that's not hard. You just push a button on the computer.

I just mainly work with Word and PowerPoint, and those were really just minimal. I think that I just picked it up from my parents. They would help me with projects; then in high school I did have one class.

### ***The planning process***

Students reported various strategies for planning the digital storytelling project.

I don't do the drafting processes. My first draft is the hardest. I just sit there, and I want it to sound good the first time. It usually takes me longer than most people. I don't do much revising.

I just write and the ideas just kind of flow. I went home and started writing my rough draft the day we started the project. I can't draw, so I thought about what I had the most pictures of. I tried to think about what was significant; then I just kind of started writing stuff. That's how I write. I don't like to outline or anything.

I established a sequence of events as I photographed my dog at the vet. I picked images that matched what the dog was saying, her body language or her surroundings. It was like the words were the description of the pictures and the picture was what was really saying the story.

### ***Relationship between words and images to convey meaning***

One student explained that she used the storyboard template to plan out the images she thought she would need to tell her story and then wrote words she felt each picture required to tell the story. She emphasized *images carry as much meaning as the words, and the two are integrally linked to convey the meaning of the story*. This student modified her images using Adobe Photoshop to establish mood: a dark hall where a little girl waited anxiously on her first day in a new school.

Another pre-service teacher explained that she did the writing first; then she went through the narrative and found the sentences that she wanted to have pictures for.

I think pictures are more personal than photographs because I could actually draw what I felt rather than this thing of clip art of a girl crying or somebody playing the piano.

A bi-lingual education student wrote her story in small groups of sentences, and below each group she sketched out a small drawing of the image that she had in her mind. Drawing content from the picture storybook project, she incorporated lines to create energy in her drawing, and color to indicate mood. She indicated that images were crucial for her story because the people that she wanted to target with her story were English language learners.

The way that they are able to understand the plot of the story if they happen to not know a word is by looking at the picture. I added words in both languages in order to enrich their vocabulary, and so that I can use my story to teach a science lesson and a language lesson.

### ***Using digital storytelling in the classroom***

Pre-service teachers indicated that they were personally motivated by the digital storytelling project and shared various ideas for how they might use the project in a future classroom.

I definitely want to do this. I enjoy this process. I want to teach fourth grade. They are going to be competent in a lot more things technologically. Just even being able to be competitive in the sense that I can go into a school with the knowledge of this technology. I will be able to apply it to my classroom rather than just fool around with the paste kind of projects.

I would probably use digital storytelling as a center that students go to. You get to write a story with some restrictions; then you get to publish your story. I think that would be better than the whole class trying to do this project at the same time. You could work with a few kids and over time every child gets to go through the center.

I want to teach first or second grade. I don't think many of those children will be into technology. I think people try to simplify technology too much. Because kids are younger, they don't expect as much from them. I think that a second grader could learn to connect their drawings to their writing. Usually there is just one picture with their writing, like they don't do multiple pictures. They could learn more about the storytelling process and how pictures and words connect.

## **Instructional Strategies in the Digital Storytelling Project**

### **Writing assignment**

Several pre-service teachers indicated that the writing assignment was too broad and indicated that there should be some specific limits. One student commented that she found the assignment confusing.

I remember thinking what on earth am I going to write about? Am I writing something that I am going to use in the classroom or is this just something that I am sharing with my peers?

Another student said *it was nice to have the freedom to choose what I wanted to do, but it was kind of intimidating.*

I think a lot of it has to do with the topic because it was kind of broad. Everyone was like I think that would be cool to hear about that because I have never had that experience or I have had that experience and I would like to know about how you saw it.

One pre-service teacher suggested that the assignment should be modified to focus on a specific age group. *Make this something that you would show your classroom either to teach them something or just to share a story with them.*

### **Virtual storytelling circle and peer feedback**

Students indicated that peer feedback responses in the virtual circle were superficial and brief and did not provide any real help. One student commented *what I got really didn't help me. It was just short comments.*

If the comments had been a bit more constructive, it would have helped. People need to spend time thinking about a response versus just saying good topic! Can't wait to see it. It didn't help me write the story. No one really gave me any new ideas. They were just validating my ideas.

Another student said that she received feedback saying her story idea was good, *but then I thought my idea was a good idea to begin with, so it wasn't that helpful to me.*

### **Digital storytelling handout**

Pre-service teachers stated that the digital storytelling handout served as a useful support as they moved from the text-based environment to using digital technology applications to construct the digital story. Several suggested that having more time in the computer lab would have been helpful.

I would not have been able to do this project without that sheet of paper that told us how to do it. I had no problem after that. Once I had the music in, I just kind of played with the transitions and the software itself. Once I was confident that I could turn in the requirements, and then I could play. But I couldn't have done it without that worksheet.

I really liked the sheet you all gave us with all the steps of it. I would suggest having a little more time in the lab; extra day or two for people to work on it because I know that there were people rushing at the end.

### **Conferencing with students**

Pre-service teachers indicated that conferencing with the practitioner and the researcher in class and by e-mail helped them focus in on a story theme and revise the written narrative. One student commented *the editing helped me a lot. I knew there were things that I didn't like about the writing, but I didn't know how to pinpoint it..... like maybe you should change this.*

Another student said the practitioner helped her cut the written narrative and suggested how she could revise some wording. *The writing help was really, really great. Having you guys there throughout the entire process was helpful.*

### **Sharing the digital stories in class**

Several pre-service teachers said that they felt a little nervous about sharing their digital stories in class; however, most students indicated that they felt really proud of their digital story and enjoyed sharing it with others.

I felt proud. Like when they laughed, I was excited.

It felt good to share what I had written with the rest of the class. We don't have the opportunity to know each other in a big class. In video you can see a diverse culture.

I was happy with mine. I was proud of my work. It made me feel special because of all the attention focused on my work.

I was really proud of myself when we were all done, and we showed the digital stories in class. You don't think you could create something when you have never done it before. When you get into a digital story, it is really fun to tell your own story.

### **Digital Artifacts**

Using Scholes (1981) criteria for story, the researcher reviewed the digital artifacts. Over half of the digital stories produced during the first implementation lacked a plot that revolved around a conflict and lead to a resolution or transformation. The videos were based on a series of photographs with a story line devised to link the photographs together instead of beginning with a narrative and using images to extend the meaning of the recorded words. These digital artifacts were more like slide shows than stories. The practitioner and the researcher concluded that many pre-service teachers did not understand the definition of story or concepts of narrative structure.

### **Discussion of the First Implementation**

The first implementation of this study attempted to determine the educational benefit of moving from writing in a text-based format to writing in the digital environment. The study investigated pre-service teachers' valuing of digital storytelling as a method to teach the writing process and evaluated the effectiveness of instructional strategies used in the implementation of the digital storytelling project.

Results of the Likert Scale Attitude Survey showed that there was a statistically significant change in students' attitudes due to the implementation of the digital storytelling project; however, the survey results did not indicate which aspects of the project lead to a positive change in attitude.

One of the objectives of this study is to look at digital storytelling as a strategy for teaching the reflective writing process. Interview data revealed that many pre-service teachers were highly motivated by the digital storytelling project; however, most pre-service teacher did not employ the reflective writing process, as it was taught in the reading/writing workshop project, when they wrote the personal narrative and constructed a digital story. While some students did link words to images to extend meaning, many of the digital stories were slide shows without a plot.

#### **Revisions to implementation strategies**

At the end of the first implementation of the digital storytelling project, the researcher and the practitioner collaborated to determine revisions to implementation strategies for second implementation of the project in the spring 2008 term. Both parties agreed to certain changes in the instructional design of the project.

#### ***Writing assignment***

The writing assignment for the first implementation asked students to write a personal narrative in first person, present tense about a meaningful experience. Based on feedback from the interview data and a review of the digital artifacts, we determined that the assignment needed to be more specific. Many pre-service did not understand the definition of story, and they did not seem to have a clear idea of what constitutes a meaningful experience. Often students relied on available photographs rather than reflecting on past experiences. The writing assignment for the second implementation used Carter's (1993) suggestion of a focused writing prompt to write a personal narrative that represents a well-remembered

event in your life. Carter defines a well remembered event as an incident or episode that a student considers salient or memorable; a short story from the student's stream of experience. Labov (2006) refers to such an event as a precipitating event or a reportable event (Riessman, 1993; Labov, 2006). Bruner says it is a breach from the expected, a predicament, conflict or struggle that leads to resolution or transformation (Bruner 1991).

### ***Order of implementation strategies***

During the first implementation of the study, the first two class periods were used to show examples of digital stories, to discuss the elements of a digital story, and to demonstrate the technology required to construct and publish a digital story. Review of the digital artifacts revealed that many pre-service teachers did not understand the difference between a story, which has a beginning, middle, end and revolves around a conflict or a transformation, and a slide show that is a series of images.

We concluded that the initial focus on digital story examples and technology methods led students to concentrate on locating images in their photo albums or scrapbooks instead of writing about an important life experience. Many of the digital stories in the first implementation were image driven; my wedding day, our family vacation, a trip to Europe with my boy friend. The researcher and the practitioner determined that the implementation order was reversed due to our enthusiasm for showing digital stories examples. We determined that the digital storytelling project should focus first on the narrative writing process; then on the digital technology methods required to transform the narrative into a digital story. "Technologies should not support learning by attempting to instruct learners, but rather should be used as knowledge construction tools that students learn with, not from" (Jonassen, Carr & Yueh 1998). Students must first write and edit their digital stories using the writing workshop process before any discussion about technology takes place or any examples of digital stories are shown. Otherwise students tend to focus on photographs instead of story.

### ***Virtual story circle***

We determined that the virtual storytelling circle would be continued in the second implementation, but students would be required to post a draft of a completed story instead of a story idea. Stories are the way in which human beings communicate meaning and construct an understanding of the

world (Bruner, 1996). We came to understand that students must actually go through the meaning construction process by posting a completed story; not just a story idea. An idea is not a story; there is no commitment or requirement to communicate with an audience.

#### ***Peer feedback in virtual story circle***

In the interview process, students commented that feedback from other pre-service teachers was shallow and did not help to narrow ideas. We determined that appropriate feedback responses needed to be modeled by the practitioner before students were asked to interact in the virtual storytelling circle. Tompkins (2007, p. 42) indicates that feedback must be positive in tone and provide specific information to authors such as organization, descriptive words, comparisons, and details.

#### ***Introduction of the interventionist conferencing model***

During the first implementation, the practitioner and the researcher conference with student during the narrative writing process writing to help them edit and revise their stories. After discussion and review of literature, we decided to implement the interventionist conferencing model as proposed in the revised edition of *In the Middle* (Atwell 1998; Taylor 2000). The interventionist conferencing model emphasizes expert demonstration, an apprenticeship approach. Atwell (1998) explains that interventionist conferencing is knowledge-based; not rule-based. She advocates intervening directly in students' writing by telling writers what works and what doesn't. "Instead of diminishing or silencing their voices, I think that raising my voice, in the company of students in the workshop, has the effect of strengthening theirs" (Atwell 1996, p. 48 as cited in Taylor (2000). This direct approach to conferencing is a change from Atwell's earlier facilitation model where she indicates that teachers should not read students' writing during a conference or tell writers what they should do or what should be in their writing (Atwell 1987). The researcher believes that the interventionist conferencing model not only supports pre-service teachers as they write and revise digital stories, but also serves as a model for effective teaching of writing in a future classroom.

## **Revisions to evaluation methods**

### ***Revision of the Likert Scale Attitude Survey***

A rotated factor matrix of the fall 2007 Likert Scale Attitude Survey yielded three factors, but the factors were not clearly interpretable when compared with the survey questions. The researcher reviewed the Likert Attitude Survey questions based on the rotated factor loadings. Questions that did not load were considered for possible revision. Several questions were restated to make the sentence structure more direct and the meaning of the question more straight forward. As an example, *Knowledge must be verified empirically to be considered true* was revised to *Knowledge must be proved for me to believe that it is true*.

The researcher also looked at the effect of word choice. For clarity, the word *image* was changed to *picture*. The word *iterative* was revised due to many questions about the meaning of the word during the survey implementation. *Writing is an iterative process* was changed to read *Writing is an active process that requires revision*.

### ***Addition of pre and post implementation survey questions***

The researcher designed a pre-post implementation survey that included three pre-implementation questions drawn from the interview script and three post implementation questions. These open-ended questions were designed to relate to constructs of interest included in the Likert Scale Attitude Survey. Students were asked to respond to the open-ended questions with a short paragraph of three to five sentences.

Interview data indicated that most pre-service teachers entered the digital storytelling project with some knowledge of Microsoft Word and PowerPoint. The researcher wanted to better understand pre-service teachers' entry level familiarity with digital technology applications and their initial attitude toward the integration of technology training in pre-service education.

Many pre-service teachers who were interviewed indicated that they do not use the reflective writing process in their own work. The researcher wanted to better understand how pre-service teachers generally make use of the writing process in a writing assignment.

Post-test questions investigated students' valuing of digital storytelling as a teaching strategy and asked students to explain the planning process they used to design the digital story. The researcher wanted



to know if pre-service teachers employed the reflective writing process to design the digital story. The researcher also wanted to know if students valued digital storytelling and the technology training in the project enough to indicate that they would use the digital storytelling project into a future classroom. The researcher included the open-ended questions as a means of contextual triangulation with the results of the Likert Scale data (Denzin 1978; Diesing 1972, p. 147- 48) as quoted in Lincoln & Guba 1985, p. 305-306).

*Pre-implementation questions*

- (1) Describe your experience level with technology in terms of previous training and knowledge of specific software applications.
- (2) Explain the planning process that you use when you approach a writing assignment.
- (3) Why is it important to integrate technology training into pre-service education?

*Post-test open-ended questions*

- (1) Describe the planning process that you used to design your digital story.
- (2) How did the digital storytelling process help you to better understand story structure?
- (3) Discuss how you anticipate using digital storytelling with students in a classroom?

## **SECOND IMPLEMENTATION (SPRING 2008)**

### **Procedure**

The revised Likert Scale Attitude Survey for spring 2008, as shown in Appendix 2-2, was administered in class at the start and conclusion of the digital storytelling project along with the pre-post implementation survey.

The practitioner presented the revised writing task to students at the first class. The writing task for the second implementation asked students to write a personal narrative in 250 to 500 words that represents a well-remembered event” in your life. The practitioner also presented a review lesson on the literary elements and narrative structure and tied the review to the grading rubric for the digital storytelling project to link prior content knowledge to the digital storytelling project. The practitioner reviewed peer feedback requirements using examples of appropriate and inappropriate responses. Students were guided

to provide meaningful comments in the virtual storytelling circle and to pose questions where the meaning of a story is not clear (Tompkins 2007). All peer feedback comments must be phrased in a positive, constructive manner (Calkins 1986; Lambert 2006; Tompkins 2007). Students spent the remainder of first day pre-writing and conferencing with the practitioner and the researcher about story topics.

Before the second class period, students were required to post a completed narrative on the class web site and give appropriate feedback to two class members. Students had the opportunity to read multiple stories as classmates posted the assignment on the class web site. Sharing writing with the class is a crucial part of the writing process model (Calkins 1986; Tompkins 2007). The posted stories served as examples for students who were struggling to construct a meaningful narrative. Peer modeling informs and motivates other students and provides information about what actions lead to success (Pajares 2003; Schunk 2003).

The second class period focused on the writing process. The practitioner and the researcher conferenced with students to help them with story construction and editing using Atwell's interventionist approach (Atwell 1998). The teacher provides expert demonstration and intervenes directly in students' writing during conferencing, telling writers what works and what does not work; collaborating directly with students to revise their writing (Atwell 1998; Taylor 2000).

During the third class period, the practitioner demonstrated the digital technology methods required to construct a digital story and provided students with the digital storytelling handout *Making a Digital Video in Windows Movie Maker* as shown in Appendix 4. She showed two well designed digital stories authored by pre-service teachers in the fall 2007 class. Both digital stories had clear plots. One story was developed with photographs; the other featured hand drawn images. Pope & Golub (2000) stress that technology must be modeled by faculty in a methods class. Technology should be a naturally supporting background for English/Language Arts content (Bowman 2000; Pasternak 2007).

Students met in the education college computer lab for classes four, five and six. The practitioner and the researcher conferenced with students to help them edit their narratives, assisted students with recording the narration, and provided technical support for the construction and publishing of the digital stories. Support was also available to students in the computer lab by appointment in the evening.

The researcher assisted the practitioner with showing the digital artifacts during the last two class periods. The practitioner used the digital storytelling project rubric that she discussed with students at the start of the project to evaluate the digital artifacts as they were shown in class.

## **Results**

### **Likert Scale Attitude Survey**

A paired sample t-test of the spring 2008 Likert Scale Attitude Survey pre-post data was conducted. Results indicated an overall statistically significant increase in the mean difference in students' attitudes due to the implementation of the digital storytelling project. The post-test mean ( $M = 99$ ,  $SD = 7.86$ ) was significantly greater than the pre-test mean ( $M = 90.2$ ,  $SD = 11.81$ ,  $t(52) = 5.8$ ,  $p < .05$ ). The standardized effect size index,  $d$  was .8, a large effect. The 95% confidence interval for the mean difference between the two ratings was 5.4 to 11.09.

A three-factor rotated orthogonal factor analysis was conducted on the Likert Attitude Survey post-test scores from second implementation of the project. The rotated factor matrix yielded three interpretable dimensions: (1) confidence with computers and technology, (2) perceived control of the writing process, (3) understanding of image. Confidence with computers and technology accounted for 14.77 % of the item variance, perceived control of the writing process accounted for 12.18 % of item variance, and understanding of image accounted for 10.56 % of item variance. Results of the factor analysis led the researcher to theorize that students' attitude toward the digital storytelling project is directly related to comfort with digital technology and a feeling of control over the writing process, as well as an understanding of story structure. Understanding of the how images extend the meaning of text appears to play a meditational role in confidence with digital technology. Results of the factorial analysis provided guidance for considering how to improve the instructional design of the course.

### **Pre-post implementation survey**

#### ***Pre-implementation survey responses***

##### *Experience with digital technology*

Pre-implementation questions 1 asked students to describe their level of experience with digital technology in terms of previous training and knowledge of specific software applications. Levels of

experience as shown in Table 3, Pre-service teacher experience level with digital technology applications, were established based on statements made by students about specific software applications and previous technology training: no experience; basic (use of word processing); intermediate (mention of at least two specific software applications); advanced (experience with video applications; Audacity, iMovie and Movie Maker).

**Table 3** Pre-service teachers' experience level with digital technology applications

Group	Number of Responses	No Experience	Basic	Intermediate	Advanced
A	21	1	5	11	4
B	32	0	7	18	7
Total responses	53	1	12	29	11
Percentage		2%	23%	55%	20%

Results indicated that the majority of pre-service teachers were familiar with Microsoft Office programs such as Word and Power Point; however, only a few students mentioned experience with Excel. In their responses, many students indicated that they learned software applications in high school; not in the university environment. Only 20% indicated that they had experience with photo editing software or with any kind of video production program.

*Use of a planning process in writing*

Pre-implementation questions 2 asked students to explain the planning process that they use to approach a writing assignment. Of the 54 students who responded to the question, approximately 15% indicated that they do not use a planning process when they write.

I write what I feel, and I don't like revising and editing.

I wrote my story one night when all the words just started coming to my head.

I tend to just start writing.

Many students indicated that they use some kind of pre-writing process such as brainstorming, outlining, listing, making a bubble graph, and jotting down ideas before they begin to draft a paper.

Approximately 30 % indicated that they go through the reflective writing cycle to complete an assignment:

pre-writing, drafting, editing and revision. Other students indicated that they combine pre-writing with drafting when they write, but they did not mention revision in their responses.

I make a list of ideas and give myself time to think; then I take my ideas and begin writing.

I think about my writing in my head; then I type it out. I leave highlighted parts that I need to come back to. After I finish this draft, I try to give myself a few hours to a day of not reading it; then I go back to review it. I feel like giving myself some time helps me to find the errors more easily.

I make a list of possible topics; then I pick a topic and do a web of possible things to include in my story. I make an outline and write what details I want to include.

Pre-implementation questions 3 asked why is it important to integrate technology training into pre-service education. Responses indicated that pre-service teachers feel that technology is changing the world we live in and that technology training should be integrated into pre-service education programs, so that new teachers will be adequately prepared to enter the classroom. Pre-service students suggested that teachers need to learn to use digital technology in order to adequately prepare students for the future.

Technology is everywhere in our world! We definitely need to learn to use it!

Technology is becoming such an integral part of education. It provides a fun way for children to learn. I think it is important for teachers to be caught up on the newest programs to help in the success of their students.

It is important that teachers utilize technological resources to teach children. The demand in society for computer competence is ever increasing.

Technology is the future and as teachers, we could have students that know more about it than we do. We should be able to use technology to benefit our classrooms in as many ways as possible.

If we do not use technology; then we will not understand how to use it with our students. We live in a technologically advanced world and must be competent.

### ***Post-implementation survey responses***

#### *Use of a planning process to design a digital story*

Post-implementation questions 1 asked student to describe the planning process that they used to design a digital story. Review of the responses indicated that many pre-service teachers used the reflective writing process to plan and construct the digital stories. Students specifically mentioned pre-writing strategies and talked about editing and revising the narratives. They indicated that they wrote the narrative first; then found or drew images to illustrate the narrative. Of the fifty-seven students who responded,

only three students indicated that they did not use a planning process. Ten students specifically mentioned using the storyboard to plan out the digital story.

I began writing the story. I kept changing it and changing it. It wasn't that I was unhappy with my story, but it didn't feel like the right story. I went on and on about a relationship, but the moment was lost in all those words. Through re-evaluating and with the help of the teacher, I produced a final draft that I was super happy with.

I wrote my story the way I would tell it in person; then I revisited it and cut it down taking out details that were unnecessary. Once I had a solid story, I brainstormed ideas for pictures and put them all together to create my digital story.

I wrote the narration first which ended up being poem-like. Then I broke it up into segments that belonged together. Next I planned out the pictures that should go with each one. I changed from pics to drawings to pics in order to convey the differences between reality and abstract thought.

I had to brainstorm what I was going to write. Then I had to edit and tighten my story. I had to focus on the moment of my story. When I finally had the writing prepared, I started thinking about what pictures I could use to support my story.

#### *Understanding story structure*

Post-implementation questions 2 asked students how did the digital storytelling process help you to better understand story structure. Pre-service teachers indicated that working through the process of drafting, editing and revising the written narrative helped them to better understand structure in story and the importance of word choice.

The digital storytelling project put us in the position of a writer which made us look at story structure in a completely different way. It also makes us be more careful about our wording because of the word limitation.

I think the extensive revision process really gives the writer the opportunity to look at story structure in many different ways. We also had to think about what would be easy to watch and be entertaining, so we focused a lot on intro and conclusion and keeping the watcher interested.

The storytelling process helped me understand story structure because it was something that you really had to pay attention to when putting the story together. It helped me pay attention to the elements that I knew needed to be included.

The drafting, editing, and revising process enabled students to see how the parts of a narrative come together to tell a story. Pre-service teachers became more aware of specific elements of story structure such as conflict and resolution, and they learned to eliminate details that did not support the development of the plot.

I've learned about the importance of conflict in a story and what details to keep and what to get rid of.

It helped me to understand where stories break and have pauses.

I had to make sure that there was a clear beginning, middle and end, and it helped me to understand how to do this.

Several students indicated that the visual aspects of the digital storytelling project helped them understand structure in a story. One student commented *putting pictures to words helped me make sure that I was sticking to a theme*. Another said *the process helped because I had to connect my pictures to the introduction, different plot points, climax and conclusion*.

Pre-service teacher pointed out that digital storytelling is a process. Working through the process helped students to understand story structure and the connection between words and images to convey meaning.

Digital storytelling is definitely a process. It really helped me to understand how illustrations can help better exemplify the text. I learned how you need to have a plot and author's style to truly grab the reader's/audience attention. Story structure is so important to learn, but digital storytelling provides a fun way to implement it.

#### *Using digital storytelling with students in a classroom*

Post-implementation questions 3 asked how do you anticipate using digital storytelling with students in a classroom. A few pre-service teachers were hesitant about using the digital storytelling project with young students in a future classroom because of time constraints and lack of access to computers. Pre-service teachers suggested using digital storytelling as a collaborative classroom project: writing a group story, showing students' work on parent's night, or presenting a field trip report. Students mentioned that digital storytelling could be used at any grade level to connect narrative writing with digital technology.

I think the digital storytelling process could be used at any grade level with help from the teacher. For lower grade levels, the teacher can record her students' voices telling their stories, have them draw pictures, and she can create the movie herself for the class. In older grade levels, the students can follow the steps we did to produce their own story.

I think this is a great way for students to bring their own personal stories and important events into the classroom. I want my future students to be able to learn more about one another.

I would use this as an assessment for the parts of a story.

I could connect it to a reading/writing workshop or with lessons on poetry. It makes writing fun for children if they can make their illustrations be part of a mini-movie.

### ***Individual interviews***

Eight females and one male volunteered to participate in individual interviews at the conclusion of the second implementation. Four areas of interest stood out in the interview data: improved quality of feedback in the virtual storytelling circle, positive response to the interventionist conferencing model, increased understanding of story structure and the writing process, as well as enhanced awareness of the relationship between words and images to convey meaning

### ***Virtual storytelling circle & peer review techniques***

Many pre-service teachers reported benefiting from feedback in the virtual storytelling circle. *I love getting somebody's opinion on my work, so I know where to go from there.* Another said *it's not just critiquing, but saying that it was a really good story. It's good to hear that, kind of lets you know if your point is getting across.* One stated that reading other people's stories helped her get ideas for her own story....*how to put more life into my story.*

Other students indicated that feedback was still not very useful. One student commented *I didn't get a whole lot of constructive feedback. I think that we've been taught to look at grammar and punctuation. I don't think students really know how to critique writing.*

### ***Interventionist conferencing model***

Students talked about how helpful conferencing with the practitioner was. Adoption of the Atwell's (1998) interventionist approach to conferencing helped students to narrow story scripts and bring a focus to the story theme. Interventionist conferencing took place in the classroom; however, much additional conferencing took place in e-mail messages between students and the practitioner and in postings to the virtual story circle. The practitioner often suggested ways that students could modify a script; however, she always included the caveat, *now this is just my suggestion. You don't have to do it this way.* Students indicated that receiving direct input about how their writing could be improved was extremely beneficial.



One pre-service teacher said, *she gave very good feedback and told me exactly what was wrong, and I needed to hear that.* Another indicated that the conferencing process resulted in a tighter paper. *When she made it present tense instead of past tense, it put more emotion into the story. She didn't take away the essence of my paper, just made it tighter.*

The supportive environment in the classroom and the positive relationship between the practitioner and students, collaborating together, seemed to increase students' confidence in their own writing abilities and helped them to better understand the writing process and narrative structure.

### ***Understanding of story structure and the writing process***

Pre-service teacher stated that the digital story construction process helped them to understand story structure and the importance of the writing process. One student said that the digital storytelling project pushed students to revise.

The way we did it we had to focus on a moment, and you had to be concise to convey that moment. It took a lot of revising to get there. It's easy when you don't have a word limit. When you need to get to the moment you have to look. Did I capture it right? Did I put the right amount of background? Is there too much background? Do I need more emotion in that moment? You really have to look at the detail that you are using.

### ***Relationship between words and images to convey meaning***

Matching images to narrative was a new way of thinking for most students. The process of breaking the narrative into meaningful segments and linking the text to images lead to a better understanding of how images can extend the meaning of words to convey meaning. *You have to pick pictures that actually depict what you are saying or writing.* One student explained that adding pictures to text reduced the need for so much narrative detail.

The pictures add so much. There's no need to drag things out in your sentences. You can be more direct because you are going to add a picture, and the picture adds so much detail. Your sentences act together to convey your messages. You don't have to work so hard describing in your writing; your picture did a lot of the talking.

Some students used the storyboard template; other devised their own planning process to link narrative to images such as putting the images and text in PowerPoint or drawing pictures on note cards. *I just turned the note card over and wrote what words I wanted to go there.* One stated *I wrote the narrative out on the template. Just to write it down helped me to visualize the story.*

### **Digital artifacts**

Using Scholes (1981) criteria for story, the researcher reviewed the digital artifacts. Out of fifty-three digital stories, only four lacked a clear plot. These digital artifacts had themes, but they were not stories. All four videos were based on sets of pre-existing photographs. Most of the digital stories reflected a clear plot that revolved around a conflict lead to a resolution and exhibited a direct connection between the recorded narrative and images used to extend the meaning of the story.

### **Discussion of the Second Implementation**

Results from the post-implementation questions and the interview data indicated that working through the digital storytelling writing and construction process in a supportive environment that included interventionist conferencing with the practitioner and the researcher helped pre-service teacher to recognize the value of the reflective writing process and better understand story structure. Review of the digital artifact also supported this statement since almost all of the digital stories had a clearly defined definite plot.

### **Revisions to implementation strategies**

#### ***Increased emphasis on story structure***

Results of the factor analysis on the Likert Scale Attitude Survey post test data indicated that students' valuing for digital storytelling is related to comfort with digital technology and a feeling of control over the writing process and as well as an understanding of story structure. The researcher and the practitioner determined that greater emphasis should be placed on story structure in the third implementation. We recognized the need to graphically illustrate story structure during the review of literary elements to reinforce an understanding of elements of plot such as rising action, conflict, resolution or transformation.

#### ***Demonstration of use of a storyboard to design a digital story***

The factor analysis also indicated that understanding of the how images extend the meaning of text plays a meditational role in confidence with digital technology. To encourage students to use a storyboard as a planning tool, the practitioner planned to demonstrate the use of a storyboard to design a digital story. The practitioner and the researcher discussed making the storyboard a project requirement;

however, the practitioner was reluctant to add an additional required component to the project. She also felt that some students would be intimidated by the need to draw images on a storyboard.

### **Revisions to evaluation methods**

#### ***Experience with digital technology survey***

Pre-implementation questions 1 asked students to describe their level of experience with digital technology in terms of specific software applications and previous training. Levels of experience were established based on statements made by students about specific software applications and descriptions of technology experience. The researcher determined that a better understanding of pre-service teachers' entry level of experience with digital technology would result from having students indicate their level of experience with a list of software applications and digital technology tasks. The Experience with Digital Technology Survey, as shown in Appendix 7, was added to the evaluation methods and pre-implementation question 1 was eliminated.

#### ***Post-implementation questions***

Interview data indicated that some pre-service teachers utilized the storyboard template as a planning tool in the constructions of a digital story. In the third implementation the practitioner will demonstrate the use of the storyboard to encourage student to use the storyboard template. Post-implementation question 2 asked how the digital storytelling process helped you to better understand story structure was replace by how did the use of a storyboard support your thinking as you combined your narrative with images. The researcher wanted to understand how pre-service teachers make use of the storyboard template as a planning tool.

### **THIRD IMPLEMENTATION (FALL 2008)**

#### **Procedure**

Pre-service teachers responded to the Experience with Digital Technology Applications Survey, as shown in Appendix 7, at the start of the first class period. The Likert Scale Attitude Survey, as shown in Appendix 2-2, was also administered at the start and conclusion of the digital storytelling project along with the pre-post implementation survey questions.

Instructional strategies for the third implementation included graphical modeling of story structure during the review of literary element to reinforce understanding of plot: rising action, conflict, resolution or transformation, and demonstration of the storyboard as a planning tool; however, the major implementation change was not intentionally planned by the researcher or the practitioner, but occurred due to the unpredictable limitations of the classroom environment.

Because of a scheduling conflict, three class periods were held in the university student computing center, an open-access computer lab, rather than in the small, class-based computer lab in the College of Education which was used for the first two implementations of this study. The projection equipment in the student computing center classroom did not work properly which interfered with the presentation of the lesson on the digital technology required to construct a digital story. The speakers did not have adequate volume, so students had difficulty hearing the audio when digital story examples were shown. The researcher had to help students record narrative in a study room in university library, an adjacent building, which took students away from the classroom environment and hampered facilitation and left only the practitioner to conference with students and support the construction of the digital stories. The environment in the student computing center was a noisy. Other students wanted to use computers in the area after the class period which interfered with interventionist conferencing and the social climate of the classroom. Fraser (1986) states “the social climate in educational settings is shaped by the relationships between teachers and pupils and among pupils. The quality and direction of these relationships affect pupils’ self-concept, motivation and performance” (Fraser (1986) as stated in Allodi 2008, p. 89).

## **Results**

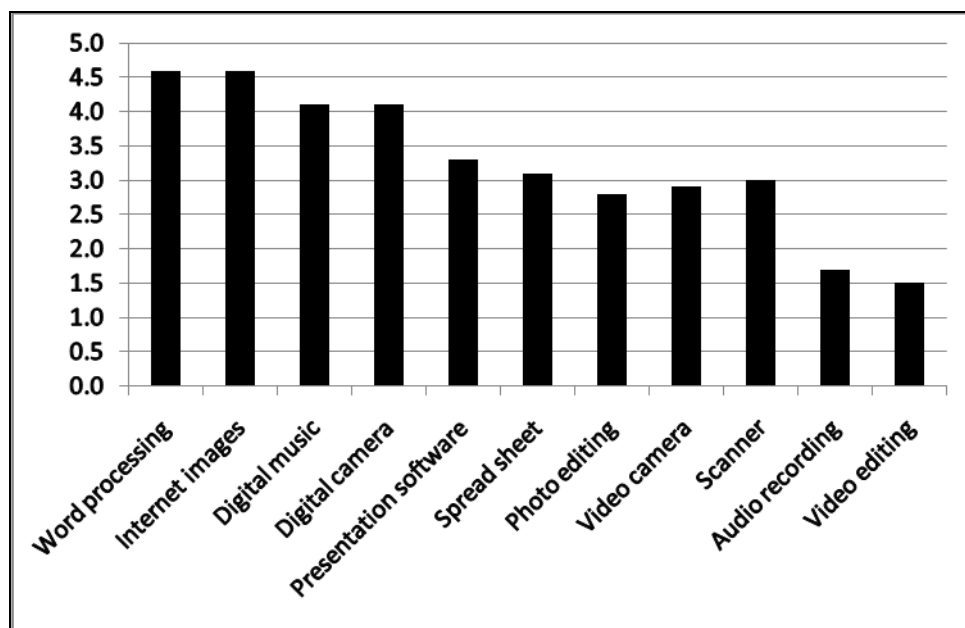
### **Likert Scale Attitude Survey**

Results of the paired sample t-test of the fall 2008 Likert Scale Attitude Survey data did not indicate an overall statistically significant increase in the mean difference in students’ attitudes due to the implementation of the digital storytelling project. The researcher attributed the lack of statistical significance to confusion in the computer lab environment when students were attempting to edit and construct digital stories. The post-test mean ( $M = 98.3$ ,  $SD = 14.26$ ) was not significantly greater than the pre-test mean ( $M = 95.7$ ,  $SD = 12.7$ ,  $t(40) = 2.03$ ,  $p > .05$ ).

The experience illustrates the importance of a supportive learning environment to the success of students in a digital technology project. Bereiter & Scardamalia (1989) assert that learners in supportive environments have high levels of self efficacy and self-motivation and use learning as a primary transformative force.

### Experience with Digital Technology Survey

Results of the Experience with Digital Technology Survey as shown in Fig. 1, Experience with Digital Technology Survey, reflected pre-service teachers' self-reported average level of experience with digital technology applications and tasks. On a scale from 1-5, pre-service teachers reported the highest level of experience with word processing software followed by presentation software and spread sheet applications. They also indicated a high level of experience with locating images on the Internet, downloading digital music from the Internet, and the use of a digital camera. Lowest reported levels of experience were with digital technology applications that are used to construct a digital story such as audio recording, and video editing.



**Fig. 1** Experience with Digital Technology Survey (Fall 2008)

## **Pre-post implementation survey**

### ***Pre-implementation survey responses***

#### *Planning process in a writing assignment*

Responses related to the use of a planning process when students approach a writing assignment indicated that 15% of the students do not use a planning process when they write. The most common response was *I just sit down and write*.

Approximately 60% of students indicated that they use some combination of pre-writing and drafting, but they did not mention revision as part of the planning process. Approximately 25% reported that they used all the sets in the reflective writing process.

Several students indicated that the projects in Reading 302, a writing intensive course, changed the way they approach a writing project.

Before this semester, I usually sit down at the computer and start writing with my other classes, I still use this method unless I look up sources and reference materials first. RDNG 302 is the only class where I am writing personal narratives, so pre-writing and revising helps.

To be honest, I have not been writing essays that much in my college career. Usually, I just think about what I want to write and then start writing. Not until this class, did I start pre-writing.

#### *Integrating technology into pre-service education*

Responses indicated that pre-service teachers believe that it is important to integrate technology into pre-service education, so that new teachers are ready to utilize technology in classroom curriculum.

One student stated *technology is a major part of our society now, and our job is to prepare students; therefore we need to prepare them in technology as well as other subjects*. Another said *technology is evolving and as future educators, we need to be aware of how to incorporate it*.

### ***Post-implementation survey responses***

#### *Use of a planning process to design a digital story*

Of the forty-two pre-service teachers who responded to the survey, thirty-three said that they used some combination of pre-writing, drafting and editing to design a digital story. Nine students specifically mentioned going through a revision process, and six students indicated that they incorporated the storyboard in their planning process.

*Using a storyboard to combine narrative with images*

Using the storyboard was not a project requirement; however, the practitioner encouraged students to use the storyboard as a planning tool. Students indicated that they used the storyboard to break the narrative into segments; to link words to images; plan the order of images, and determine timing.

It helped me break the story up and decide where I wanted the breaks. It also helped me decide what pictures I wanted to use at what points in the story.

I allowed the words to choose the pictures and found that the storyboard really helped the process.

It helped me to organize and find the breaks in my story for pictures.

The storyboard allowed me to organize my images and place them in order according to my story. I was able to assign a certain amount of time to each image.

Approximately 10% of the pre-service teachers said the storyboard was not helpful in planning the digital story. Five students said that they did not use the storyboard at all. One stated that using the storyboard made the project more difficult.

*Digital storytelling in a future classroom*

Most of pre-service teacher indicated on the post-implementation survey that they plan to use digital storytelling in a future classroom.

I see this as a way to make the writing process more exciting.

I think digital storytelling is a great way to publish stories.

I think it this is a great way for students to get motivated to write.

I think it would be a fun learning experience for my students because they not only get to publish their work, but they get to share their experiences.

Approximately 9% of pre-service teachers who replied to the survey said that they probably would not use digital storytelling in a future classroom. One student said the project was too much work. Another was concerned about her ability to administer the project in a classroom of elementary students. This student also said the project was difficult for college students.

**Individual interviews**

Individual interviews were conducted with six female students. Certain areas of interest stood out: benefits of the virtual story circle; effect of interventionist conferencing; application of the reflective

writing process; use of the storyboard to link words to images, and the impact of sharing digital stories with an audience.

### ***Benefits of the virtual storytelling circle***

Pre-service teachers reported that the opportunity to read many stories in the virtual storytelling circle was very beneficial.

I ended up reading five or six stories. It helped me to realize that there were other ways to tell a story. It extended the boundaries of my story and helped me to make my story more creative. I realized that there is not just one way of writing; there are many ways.

Another commented that being able to compare her story to others helped her to understand how to write more concisely. *I can be very wordy. I read their stories, short and concise. I realized I really needed to cut a lot of description out of my story.*

Providing peer feedback allowed students to put content knowledge into practice and be more aware of how to critique writing. In class the practitioner told student to focus on story and stay away from picky points like punctuation and spelling. She stressed three points: be tactful, be complimentary, and make specific recommendations for change as a suggestion. One student said she learned how to critique writing. *I learned how to be critical and tactful. I know that I am not practiced enough in that, but I learned the difference in this class.*

While there were many positive comments about peer feedback in the virtual storytelling circle, two students complained that the feedback they received was not specific. One said *I felt like I really invested and gave an opinion. Other people who posted on my story were like oh, it sounds great. I felt like some of my peers didn't really make an effort.*

### ***Effect of interventionist conferencing***

Pre-service teachers indicated that sitting down and working with the practitioner helped them to better understand the editing process. Several students said that they did not know how to cut the length of the narrative to make the story more concise.

Working with the teacher helped me to focus the story, come up with a strong and definite theme throughout, and also to use very descriptive words. I was able to see that I was repeating things in my story that didn't really need to be repeated.

I had my story, and I already knew what my story concentrated on, what the main theme of my



story was, but I just didn't know how to make it shorter, smaller.

I didn't know how to make it shorter without changing the story. I didn't think it was going to make sense if I made it shorter. She helped me make it shorter.

She didn't change the message of my story. She just made it shorter. That was really hard for me because I love details. She helped me make it more in present tense. I realized that I would say three consecutive sentences and all three sentences were saying the same thing.

One student said that conferencing with the practitioner made her feel more confident about her narrative. *At least knowing that the direction that I was going in was right. I feel like this was such an open project left up to whatever you wanted to do whatever you wanted to write about.*

One student said that interacting with the practitioner motivated her to work on her project.

I mean having that help person to person, it's more personal. Seeing how much you guys were helping us motivated me even more because you really cared about us doing a good job, so I really wanted to improve my work.

### ***Application of the reflective writing process***

Students described personal variations of the writing process, but all mentioned going through a reflective process; not just writing. For some writing begins with thinking.

Initially I went back, and I thought. I tried to retell the story in my mind...what I remembered, the sequence of what happened when; then I pre-wrote and got my ideas down on paper and mentally started gathering pictures in my mind.

One student shared her story first with classmates; then made an outline. *I tried to think back and write every single detail. It came out to 700 words.* To edit, she went through a subtraction process.

Another said that she finds it hard to think with pen on paper. *I pre-write on the computer just typing ideas in rough draft form.* All students mentioned revising and editing. They stated that the most difficult part of the writing process was cutting down the written narrative; limiting the number of words. On the post implementation survey, over 50% of students indicated that they used a reflective writing process to design their digital stories.

### ***Use of the storyboard to link words to images***

Interview data revealed that students employed several different strategies to link narrative with images. One pre-service teacher explained that the storyboard visually helped her place images and control timing in her digital story.

When I was doing the timing for the video, it finally clicked. Okay, I can stretch that picture and that's exactly what I wanted to do with the storyboard. The story boarding helped to show exactly where one image should break off and the next start. That was the thing that I couldn't have done without the story boarding. You want it to blend, so that what they are seeing gets to their emotions just there and there. Before I've done visuals and papers where you put up a slide and read, put up a slide and read. This is all blended together.

Another student listened to her recorded narrative and wrote down what kind of pictures she wanted as she was listening to the story. One student numbered the pictures she planned to use with her narrative. *The way my pictures came in they were numbered, so I would either write a description of the picture that I wanted to use or the picture number on the storyboard template.* A student shared *I did not want to do it on paper. I used Word and separated the text into sections; then I put pictures on top of the blocks.*

Not all pre-service teachers used the storyboard template. *I didn't really want to do the storyboard on paper. Maybe if it was on the computer..... that way I could already have everything typed up then I could just cut and paste the sections.*

### ***Sharing digital stories with an audience***

Sharing the digital stories with others played a strong role in motivating students. One pre-service teacher said *I showed it to my co-workers. They were laughing. They had never heard of digital storytelling. They loved it.* This student told a personal story about an embarrassing event; being hit in the face with a softball in high school. She commented that looking back and telling the story to others helped her grow as a person, and she realized that her story connected with other people.

When you look back and share with other people, they go...oh that happened to me too. It makes you feel more human. It helps you connect with other people because you can relate to them.

Another student talked about sharing her story with her older sister and brother. *It brought back memories. We are trying to make our memories strong; we bonded over my video.*

Sharing stories in class let students understand a little more about each other. One student said

I feel like every single video we watched it was like I got to know that person better. Getting to see our classmates' videos showed us a little bit of who we have in the classroom, like the different personalities we have and experiences that we've all had.

Another student commented about her classmates *you would see them in class, but you would never really think that they would do something like dancing at a halftime show. I think sharing digital*

*stories could really build a community within the classroom. Beyond learning about classmates, completing the project and sharing the stories made students proud. I was happy with the way my digital story came out, I felt proud of my video, and I wanted to share it with everybody.*

### **Digital artifacts**

Review of the digital artifacts using Scholes (1981) criteria for story revealed that there were no documentaries this semester; some of the digital stories were serious and some were funny, but all the digital artifacts had a beginning, middle, and end and revolved around a conflict that led to a resolution or transformation. The researcher concluded that increased emphasis on story structure during the review of literary elements coupled with interventionist conferencing during the editing process better enabled students to apply prior content knowledge to the digital storytelling project and construct more effective digital artifacts.

### **Discussion of the Third Implementation**

The supportive environment of the classroom was disrupted in the third implementation during the construction phase of the digital storytelling project.

The class had to be held in the university student computing center, so students did not have as much access to individual help from the practitioner and the researcher as they finished the editing process and completed the digital stories. In spite of this obstacle, the digital artifacts were all stories and many students began to use the storyboard template as a planning tool.

The factorial analysis from the second implementation indicated that students' attitude toward the digital storytelling project is related to their understanding of the writing process and story structure, the role of image in communicating ideas, and their comfort level with digital technology. In discussion, the researcher and the practitioner concluded that the digital storytelling project is more than a culminating project that draws on prior content knowledge. For pre-service teachers, digital storytelling is a synthesis experience that requires integrating understanding of image from the picture storytelling project with the writing process and knowledge of literary elements; then shifting this awareness to the digital environment.

The researcher and the practitioner determined that the review of literary elements and story should be presented in a more structured format that would provide both visual and verbal reinforcement through graphical modeling of story structure and the use of a story example. We also agreed to add the storyboard as a requirement to the project for the fourth implementation.

### **Revisions to implementation strategies**

#### ***Inclusion of mini-lessons***

Three structured mini-lessons were included in the fourth implementation to scaffold story structure, understanding of image to convey meaning and use of a storyboard, and the digital technology required to construct and publish a digital story. Scaffolded instruction is “the systematic sequencing of content, tasks, and teacher and peer support to optimize learning” (Dickson, Chard, & Simmons 1993 as quoted in Larkin 2002). Students receive support until they can apply new skills independently (Rosenshine & Meister 1992 as cited in Larkin 2002).

Mini-lessons are short, focused explanations and demonstrations on a specific topic used to present information and provide opportunities for guided practice (Calkins 1986; Atwell 1998; Tompkins 2007, p. 37). Atwell contends that mini-lessons reach more than one writer at a time, and they provide frames of reference and establish a shared vocabulary when the instructor conferences with students. The researcher believes that pre-service teachers are better able to make the shift from writing in the text-based environment to the digital environment when the experience is scaffolded by mini-lessons that teach the required skills in sequence, and students are also supported by an interventionist conferencing as they edit narratives and construct digital stories (Atwell 1998).

Even though pre-service teachers complete a literary elements project just prior to the digital storytelling project, the researcher believes that the mini-lesson on story structure is a necessary transition to the digital storytelling project. In the literary elements project, students look at individual components while the digital storytelling project requires students to integrate their understanding of the literary elements to write a story and then shift the content knowledge into the digital writing environment.

### ***Addition of a story example***

The researcher and the practitioner agreed that a personal narrative example would be used to review the literary elements and illustrate story structure at the start of the digital storytelling project. We determined that use of a story example would better enable students to understand story structure and help students to select a meaningful story theme.

### ***Storyboard requirement added to project***

In the fourth implementation, students were required to use a storyboard template to plan the digital story. Chung (2006) states that storyboarding is a process of visualizing how a movie or digital story will look. The storyboard is a planning tool that helps students efficiently organize the development of a story and keeps the story focused in terms of timing, imagery, audio, and music. Vygotsky (1978) states that signs and symbols, such as the images on a story board, serve as abstract tools in changing the nature of human mental functioning. Stone (1962) states that there are two parts to communication: discourse and appearance. Storyboards provide the visual component for communicating (Huff-Corzine 1998) and help students to link the narrative text to images in a digital story. In the first three implementations of the study, students were encouraged to use a storyboard as a planning tool, but the use was optional. The researcher theorized that when students link narrative blocks to images on a storyboard, they are better able to understand the meditational relationship between words and image to convey meaning.

### ***Class discussion of the reflection responses and digital stories***

During the final two class periods, students will share the published digital stories. Each student will have the opportunity to briefly comment on his/her story. The practitioner will also engage students in discussion related to the reflection questions. Benmayor (2002) suggests that the value of the digital story telling process for students increases when time at the end of the process is provided for analysis and theorizing through structured reflections and discussion (Weis, et al. 2002). Telling a personal story becomes a social process for making lived experience understandable and meaningful. By making the details of one's life accessible to others in public discourse, personal narratives bridge the dominions of public and private life (Ellis & Bochner 1992). Benmayor (2002) indicates that the digital medium allows

students to tell identity stories and theorize them at the same time; thus becoming a gateway for constructing self and also for contributing a new perspective on identity, community, belonging and selfhood (Weis, et al. 2002).

### **Revisions to evaluation methods**

#### ***Revision to the Likert Scale Attitude Survey***

The Likert Scale Attitude Survey was revised based in rotated factor loadings from spring 2008. Questions that related to narrative knowing and reverse coded questions were eliminated. Such questions did not load in fall 2007 or spring 2008. Based on the identifiable constructs from spring 2008, two questions were added related writing, one related to technology, and one related to image. The number of questions was reduced to twenty. Only ten to fifteen minutes is available for administration of the Likert scale survey and the implementation survey.

The researcher believes that reducing the number of questions will increase student concentration on both the Likert Scale Attitude Survey and the implementation survey responses. These post-project evaluations will be administered at the seventh class period prior to the viewing of the published digital artifacts. There is often a kind of celebratory atmosphere in the classroom at the final class period. Students tend to rush through responses to Likert survey and the post-implementation responses.

#### ***Addition of reflection questions***

Student will be required to post responses to two reflection questions on the class website prior to the final class in the digital storytelling project and asked to be prepared to comment about the digital storytelling experience in class. Reflection is a central component of the writing process. The reflection responses give students space to consider the digital storytelling experience and to think about how their ideas about using digital technology in a future classroom may have changed as a result of the digital storytelling project.

1. What did telling your digital story mean to you?
2. How did engaging in the digital storytelling project change the way you  
feel about teaching in writing process?

### *Addition of field notes to data sources*

During the last two class periods, the researcher planned to take notes during the class discussion of the reflections questions and the digital artifacts.

## **FOURTH IMPLEMENTATION (SPRING 2009)**

### **Procedure**

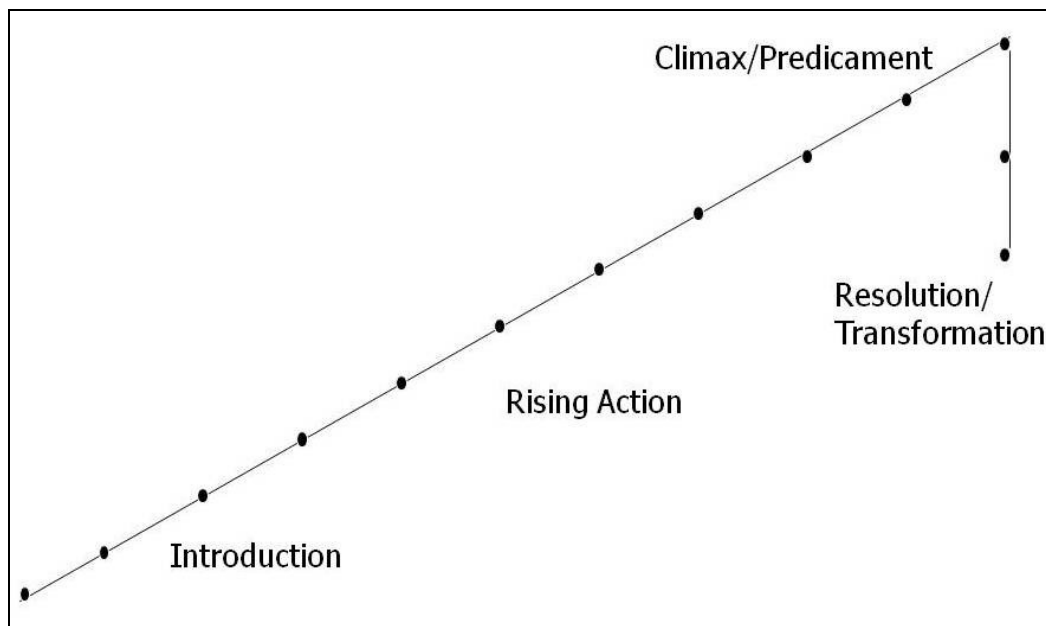
Pre-service teachers responded to the Experience with Digital Technology Applications Survey, as shown in Appendix 7, at the start of the first class period. The revised Likert Scale Attitude Survey for spring 2009, as shown in Appendix 2-3, was also administered at the start and conclusion of the digital storytelling project along with the pre-post implementation survey questions.

Before the first class, students were required to read the short personal narrative *Eleven* by Sandra Cisneros (1991) and analyze the story in terms of the literary elements (setting, theme, characters, plot, point of view, author's style). In class the practitioner presented the mini-lesson, "What is a story?" The presentation opened with the question "What makes a story good?" to generate discussion and cause students to reflect on prior content knowledge. Next traditional definitions of story were presented:

- A story is an account of events occurring over time (Bruner 1991).
- A story has a specific shape or structure (Scholes 1981).
  - Beginning-middle-end
  - Situation-transformation-situation
  - A story contains three basic elements:
    - A situation that involves a conflict or predicament
    - A protagonist who engages in the situation for a purpose
    - A sequence with implied causality during which the conflict is resolved.

Bruner states that there are many approaches for expressing narrative sequence or plot. "What underlies all forms for representing narrative is a mental model whose defining property is its unique pattern of events over time" (Bruner 1991). To help students visually connect the definitions of story with the concept of plot, the practitioner used a graphic representation, a modified version of the Freytag (1893) plot structure model as shown in Fig. 2, Modified version of the Freytag plot structure model. Freytag's

original model was designed to analyze ancient Greek and Shakespearean drama. The practitioner considers the modified model appropriate to the structure of childrens literature where the action of the story generally drops off quickly once the conflict has been resolved. Students used the modified Freytag model to graph story structure in the literary elements project, so they were already familiar with this method of representation.



**Fig. 2** Modified version of the Freytag plot structure model

The practitioner used the short personal narrative *Eleven* to visually illustrate story structure. She also related the literary elements to the project grading rubric as shown in Appendix 3. According to Walmsley & Walp (1990), using literature that has been read as a model is a beneficial approach to teaching specific strategies and skills. Modeling is a vital part of helping students learn the process of constructing meaning and helps them learn new strategies and skills involved in the writing process (Bandura 1986).

Next the practitioner presented the writing assignment and discussed the project timeline with students. As in previous implementations, the practitioner and researcher conferenced with students about



story ideas, and students posted a completed draft on the virtual storytelling circle for peer feedback; then they worked to edit and revise their narratives during the second class period.

At the beginning of the third class, the practitioner presented a mini-lesson, “Using a Storyboard: Linking Narrative to Image to Tell Your Story.” A blank storyboard template and a completed storyboard were shown during the presentation; then students watched a digital story example and discussed how images extended the meaning of the recorded narrative and contributed to the effectiveness of the digital story. This semester students were required to use a storyboard template to design a digital story. They had the option of writing text and drawing images on a template in pdf format or using a Microsoft Word template. The digital template allowed students to copy text from a completed draft to the storyboard and import images directly into the document.

During the fourth class, the practitioner presented a mini-lesson: “Making a Digital Story in Window Movie Maker.” This lesson showed students how to construct and publish a digital story. During the next two classes the practitioner and researcher conferenced with students, assisted with recording narration, and provide support with digital story construction and publication. The College of Education computer lab was available to students all day and by appointment with the researcher in the evening.

During the final two class periods, students shared the published digital stories with classmates. Each student had the opportunity to preface his/her story with a personal comment. The practitioner also engaged students in discussion related to the reflection questions. (1) What did telling your digital story mean to you? (2) How did engaging in the digital storytelling project change the way you feel about teaching in writing process?

## **Results**

### **Likert Scale Attitude Survey**

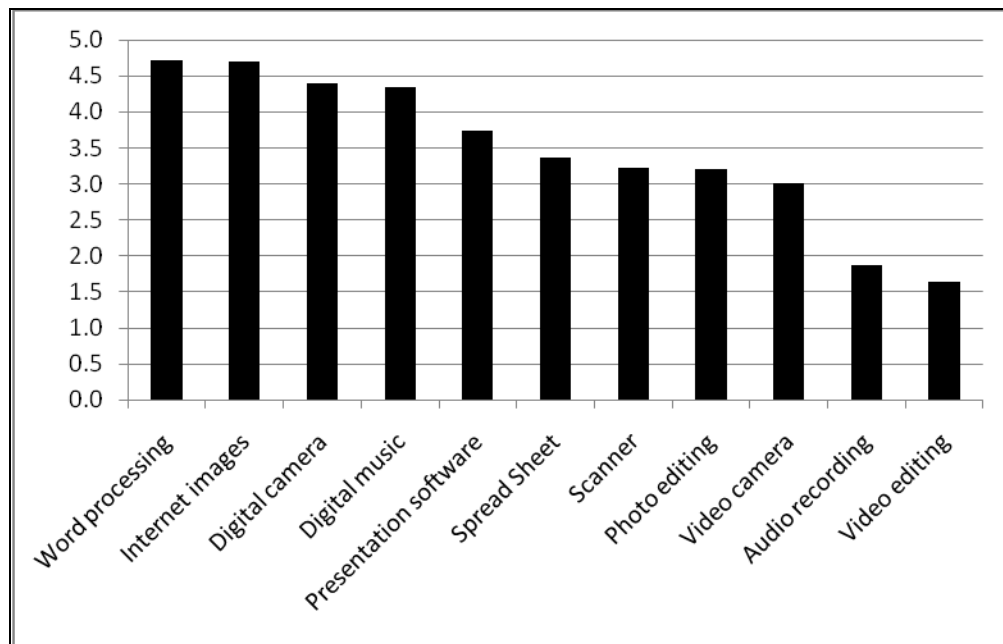
A paired sample t-test of the spring 2009 Likert Scale Attitude Survey data was conducted. Results indicated an overall statistically significant increase in the mean difference in students’ attitudes due to the implementation of the digital storytelling project. The post-test mean ( $M = 81.73$ ,  $SD = 10.01$ ) was significantly greater than the pre-test mean ( $M = 77.80$ ,  $SD = 9.65$ ,  $t(58) = -4.5$ ,  $p < .05$ ). The

standardized effect size index,  $d$  was .6, a medium effect size. The 95% confidence interval for the mean difference between the two ratings was -5.67 to -2.19.

To evaluate the effectiveness of the Likert Scale Attitude Survey, an exploratory factor analysis was conducted on the post-test data to determine latent dimensions underlying the measurement instrument. The rotated factor matrix yielded two interpretable dimensions: (1) understanding of the writing process and images (2) confidence with computers and digital technology. Understanding of the writing process and images accounted for 26.3 % of item variance. Confidence with computers and technology accounted for 14.4 % of the item variance. Results of the factor analysis led the researcher to theorize that students' change in attitude towards the digital storytelling project is directly related to understanding of the writing process and images as well as confidence with computers and digital technology. The two factors together accounted for 41% of the item variance.

#### **Experience with Digital Technology Survey**

Results of the Experience with Digital Technology Applications Survey as shown in Fig. 3, Experience with Digital Technology Survey, indicated that pre-service teachers entered the digital storytelling project with a range of digital technology applications experiences. Pre-service teachers reported the highest level of experience with word processing software followed by presentation software and spread sheet applications. They also indicated a high level of experience with locating images on the Internet, down-loading digital music from the Internet, and the use of a digital camera. Lowest reported levels of experience were with digital technology applications that are used to construct a digital story such as audio recording, and video editing.



**Fig. 3** Experience with Digital Technology Survey (Spring 2009)

#### **Pre-post implementation survey**

##### ***Pre-implementation survey responses***

##### ***Using a planning process on a writing assignment***

Pre-implementation question 1 asked pre-service teachers to describe the planning process they use when working on a writing assignment. Analysis of responses indicated that approximately 20% of the pre-service teachers who responded to the survey do not generally use a planning process when they work on a writing assignment

I'm pretty bad about planning. I will sit at my computer and write it.

Honestly, I don't plan. I just write what's on my mind.

I do not normally plan writing unless it is a part of my grade.

I plan in my head. It is difficult for me to write a plan down. It feels like once you write it down, you're stuck.

Other responses showed that approximately 40% of pre-service teachers used some form of planning process when they work on a writing assignment. Pre-service teachers mentioned a variety of strategies such as brainstorming, webbing, outlining, bulleting key points and rough drafting to develop a writing assignment. Approximately 40% of the pre-service teachers indicated that they use all the steps of the writing workshop planning process when they work on a writing assignment.

*Integrating technology into pre-service education*

Pre-implementation question 2 asked why it is important to integrate technology training into pre-service education. Responses indicated that pre-service teachers included in the study held a positive attitude toward the idea of integrating digital technology training in the pre-service education. 100% of pre-service teachers indicated that including technology training in the pre-service education curriculum is important.

Approximately 70 % indicated that pre-service teachers must learn technology skills in pre-service education in order to be prepared to successfully integrate technology in the classroom.

Children love technology, and I don't know how to use it.

It is important for us to learn technology, so we can teach our students.  
They are growing up in a world of technology. We need to know about it.

I am more than willing to use technology in my classroom as long as I know how to use it.  
Technology needs to be in the classroom. If I learn how to use the technology now, it will be much easier to incorporate it into my classroom later allowing for a smoother transition.

Approximately 30% of pre-service teachers pointed out that students in the 21<sup>st</sup> century live in a world of technology, and pre-service teachers must be able to effectively relate to students who view technology as a part of their daily lives and are already comfortable using technology in multiple formats.

Technology is taking over! Children in our classes most likely love technology and will be more involved if we use it in the classroom.

Technology is the new way! The students who are going to be in my classroom will have far surpassed the technology wave. They are probably more into it than me! It makes learning the more fun!

Technology surrounds us daily. It is important for students to feel comfortable with technology at a young age in order to be successful with it as an adult.

### ***Post-implementation survey responses***

#### *Using a planning process to design a digital story*

Post-implementation question 1 asked pre-service teachers to describe the planning process that they actually used to design a digital story. Analysis of responses indicated an increased use of the planning process as pre-service teachers constructed digital stories. Of the sixty-three pre-service teachers who responded to the survey, 95% reported using some kind of a planning process, with 65% indicating that they went through all five steps of the writing process. 5% of pre-service teachers stated that they did not use a plan.

#### *Reported no planning process*

Writing the story was my main planning tool. Once the story was complete, the digital elements fell into place.

I just went for the story and wrote as if I was living in the moment. I had a difficult time deciding on a topic, but managed to do okay once I had it picked out. Once that was done, I allotted time for the technology aspect of the project and with help, I did okay.

When the idea for my story came to me, I went with it. I am really not a pre-writer and so my pre-writing here was an afterthought. I know that might not be the best way, but that is the way it works for me.

#### *Reported using some form of planning*

Coming up with a story I could use was difficult. I jotted down main ideas for the event; then created what I remembered.

I thought about memorable moments in my life. Once I decided on an idea, I wrote a brief outline of what my story would be.

I wrote down all my thoughts in a list. I pretty much just wrote down everything I could remember that happened. I then put it in paragraph form and cut it down from there.

#### *Reported using the 5-step writing process*

I brainstormed a story that I could remember well and jotted down some memories. I wrote my draft and then revised it after I got feedback. I recorded it and then organized my storyboard and found pictures. After all the information was there, I compiled it using Window Movie Maker.

I brainstormed various events to use as a subject and chose one of the events and then began drafting. I then began to revise my draft, and I did this numerous times. I recorded narration and began choosing images. After this, I dropped them all into the Movie Maker and was done.

I first wrote down the events that happened and completed a rough draft. A peer edited my story; I condensed it down a little more. Once in the computer lab, I realized it needed to be even

shorter and managed to tighten my story by eliminating unnecessary parts.

*Using a storyboard to construct a digital story*

Post implementation question 2 asked student how the storyboard supported thinking as they combined narrative with images. Responses indicated that some students used the storyboard primarily to break the narrative into blocks. *It helped me figure out where my story broke up into separate thoughts.* Others used the storyboard as a reflective tool to link words to the images they selected. Students reported reading or listening to the narrative and visualizing what image would best relate to words; then using a key word search in Google to find images. One student said *the storyboard helped me decide what the words “looked” like.* Another explained

The storyboard helped me map out my story and look for the appropriate “pauses” when I split up the text. It allowed me to think of the images I wanted to use and how these images could best convey my story.

Not all students liked using the storyboard. On the post implementation survey, 11% of student indicated that the storyboard was not useful as a planning tool.

I didn't use a storyboard worksheet. I did not like the layout. Instead I just wrote notes on my final draft.

I honestly did not create a storyboard. I found it pretty easy to place my pictures on the line that I wanted to use and then adjust the time as necessary.

*Using digital storytelling with students in a classroom*

Post-implementation question 3 asked how do you anticipate using digital storytelling with students in a classroom. Most pre-service teachers indicated that they would use digital storytelling to teach the writing process. They stated that combining technology with the writing process motivates students to write. They suggested using digital storytelling as a group project both in language arts and social studies.

Of the sixty-three pre-service teachers who responded to post-implementation question 3, three students indicated that they were not sure they would use digital storytelling in a future classroom; however, their responses did not provide a specific reason.

### *Using digital storytelling to teach writing*

I think I would use digital storytelling with my student to encourage reluctant writers to dive into the writing process with the promise of making a movie.

I can use my digital story as an example and use it to teach the 5 step writing process. I would love to have my students create their own digital stories to learn more about them and teach them about the writing process.

I think it would be a great project for students to choose a story or idea they care about and add drawings to make a digital story. I remember making books when I was in elementary school, and I feel like this is a modern version of making books.

### *Using digital storytelling to motivate students to write*

I would use digital storytelling mostly as a motivational tool to get students into narrative writing and sharing work with peers. It is a fun way to incorporate technology into that classroom that I feel student would enjoy. It also seems very beneficial even across grade levels.

I plan to have my students write stories about their families and summer vacations. I can really see how this could motivate students to write.

I think it will give students a motivation to write stories worth publishing. I think it could also really help when used within content areas.

### *Other classroom application for digital storytelling*

I anticipate using it if I have an older elementary class. I think having groups of students come up with a story and work on it together would be a positive experience. Making a story as a class and constructing it together would be fun too!

I plan on being a language arts or social studies teacher. In English I could use this just as we have done and in social studies let students illustrate and tell different stories from history such as Lewis and Clark.

I would use digital storytelling as a means to introduce my future students to each other as a get to know me activity at the beginning of the school year. I may use it to tell stories to my students or have my class write a story to make a video together. In an older classroom, I would have my student make their own video.

## **Reflection questions**

### *Teaching writing in the digital environment*

Reflection questions I asked pre-service teachers how engaging in the digital storytelling project changed the way you feel about teaching writing in the digital environment. Pre-service teachers said that the digital storytelling project made them think about the steps in the writing process.

Digital storytelling enhances all parts of the writing process. Before I always saw writing as something you just kind of do to turn in and get a grade. The teacher is the only person who

really cares to read what is written. With digital storytelling, every part of the writing process matters.

Having to tell my story in such a few words made me aware of what is really important in a story; every word has to matter. This was a different way of writing than I was used to, and I believe it will help me as a future teacher in teaching a style of writing that is conscious of making every sentence in the story matter to the message of the story.

I decided it's much harder to write 200 words than 2000! It really makes you see how to choose the exact words that convey what you want the reader to understand.

Out of the fifty-five pre-service teachers who responded to reflection question 1, only three students indicated that they would not feel comfortable using digital storytelling to teach writing in a future classroom. Two had difficulty understanding how to use digital storytelling in a classroom curriculum; the third student felt that the project was not appropriate at the kindergarten level.

### ***Telling a personal story***

Reflection question 2 asked pre-service teachers what did telling your digital story mean to you. Analysis of responses indicated that pre-service teachers valued digital storytelling as an opportunity to tell a personal story and talk about self and as a chance to reflect on an important life experience. They enjoyed sharing the digital stories with classmates and learning about the life experiences of other pre-service teachers. Pre-service teachers also mentioned having a sense of accomplishment and pride in the digital artifacts that they constructed.

Telling my digital story meant that I could relive a moment. While writing my story, I got the same butterflies in my stomach that I had over seven years ago. I used my words to explode the moment and share a little bit about who I am.

Telling my story was very difficult at first because of narrowing it down to the core. But once I did, I felt like I actually owned that story. I owned those words and that moment in my life. I could actually step back in time and recreate the emotions I felt. It was like it happened all over again.

My story is important to me because it shows exactly who I am; shy and quiet until you get to know me. I don't remember a whole lot during my kindergarten years, but this is one memory that has stuck with me forever. After the writing and digital story process, the overall "lesson learned" in my story has opened my eyes because sometimes I am still very much like the child in the video; scared and maybe sometime too quiet.

### **Individual interviews**

Interviews were conducted with twelve female pre-service teachers at the conclusion of the fourth implementation. Specific areas of interest in the interview script included instructional strategies in the



digital storytelling project: the virtual story circle, interventionist conferencing, use of the storyboard, sharing digital stories with an audience; and use of the planning process in the digital storytelling project.

### ***Instructional strategies in the digital storytelling project***

#### *Virtual story circle and peer feedback*

Pre-service teachers indicated that the virtual storytelling circle provided a medium for peer review and also afforded them the opportunity to read many stories. One pre-service teacher commented that she enjoyed the virtual story circle because she likes getting feedback from peers about her writing and what she can do better. *I will think a piece of writing is fine, but then other people will notice things. It's different when you read someone else's writing versus your own.* She said that that two different people posted feedback to her story both telling her that she rushed the ending too much. She also mentioned that the virtual storytelling circle was a great opportunity to see everyone else's story.

The variety was just so great, so many different stories, and you got to relate to everyone personally, just peer to peer. It helped to develop your story because you could get ideas from everyone else. I read almost all of the stories because I really wanted to know what other people did. I was worried because mine was so long. Before I got my story down to 500 words, I went through and read all the stories just to see how they cut stuff out. It was good having those to look at.

Another student said that reading other stories was kind of an encouragement.

You are not worried about your story being weird or not like what was expected. It helped to see where everybody else was going and the types of stories they were writing.

Selecting a topic for a digital story is difficult for some students, but reading other students' stories provided ideas and examples.

I found ten different topics that I could have done. Either it was going to be too much for 250 words, or it just wasn't going to have a good plot line. I read almost everybody's story. It helped me to think about my story. Only one person gave me feedback. Her feedback was actually good because I didn't realize that I was leaving out parts of my story.

#### *Interventionist conferencing*

Pre-service teachers said working with the practitioner on a one-on-one basis helped them to edit their stories and produce a better product. One student said

When we are a whole class and the teacher says here are some guidelines, you really don't get the help you need. Some people can catch on, but other people are like what does she mean by this? I would rather have the teacher right there saying this is what I mean, or you need to do this or this could be better. I need someone to show me.

Cutting down the written narrative to the assignment word limit was difficult for many students. Working with the practitioner helped student eliminate details that did not support the development of the story. A student stated *I don't think I would have been able to do it on my own. I would read and read my story. It was hard for me to figure out what I could cut out.*

Another student said that conferencing with the practitioner helped her to narrow her story focus and understand what would work and what wouldn't work. She commented *it's good to know that a teacher can intervene. I might worry about hurting feelings or stepping on toes. It's good to know that saying something will help out more than not saying something.*

Several pre-service teachers pointed out that often students are concerned that their work isn't good enough, so being able to talk it over with an instructor helps them to get on the right track.

When someone does not let you know that you are not on the right track and then you finish; that's going to affect your grade. That's going to affect the final product, so it's better to find out early than too late. It really helped me being able to talk about what my ideas were.

One student commented that conferencing with the practitioner forced her to get to another level of thinking about her story.

She gave me a couple of ideas. I kind of went off of her ideas. I just started going through and combined a few sentences, so I could take some stuff out. I ended up seeing some things that had nothing to do with the story. I cut them out. I really liked the end product.

#### *Use of the storyboard to link words to images*

Using the storyboard as a planning tool actively engaged pre-service teachers in linking recorded narrative to visual components in a timed sequence to convey meaning to an audience. Interview data indicated that using the storyboard to support thinking as pre-service teachers constructed a digital story increased pre-service teachers understanding of the relationship between words and images to convey meaning.

One pre-service teacher commented that the storyboard was a good way to sort of piece out the narrative into the sections of the movie.

You kind of saw how it was going to transition, and you also got a chance to figure out what would connect best with the words in that piece, so that you could have an image that really matched and represented what you wanted through the writing.

She mentioned that finding the right images on the Internet took a lot of time because Google does not always provide images that fit with the story. *Without images, your narrative would have to explain, so that someone could picture the image in their head; maybe not the exact image, but to get enough detail so you feel like you are there.*

Another student used the storyboard template as a preliminary tool to break the written narrative into blocks and determine the images that would be required to tell her story. *I sketched the storyboard and that helped me visualize my digital story and make sure that it was in order.*

One student said that she had never used a storyboard before the digital storytelling project. She commented that the storyboard helped her to split the story up and determine where she needed images.

I made my storyboard, but I ended up having to go back a couple of times to add a couple more images. The text was too long, so the picture just dragged on for ever. I just went back and added another box and split up the text, and it worked fine.

#### *Sharing digital stories with an audience*

Pre-service teachers indicated that they enjoyed a writing assignment that provided an opportunity to revisit and reflect on a meaningful life experience and also allowed them to tell a personal story. Sharing the digital stories in class let students bring to light identity events and be present as individuals within the learning community.

One student shared that telling her story brought back good memories. *It's been three years since I danced.*

Sometimes when you are just going through life, you kind of forget about some of the sweet things about growing up. It was just really nice to remember; just thinking about it and remembering that was a huge part of my life ...being who I am.

Another student told a childhood story about catching insects with her brother.

The best part of the digital storytelling project was reliving the memory; cherishing every bit of it because it forced me to relive that moment in such exquisite detail that I was able to put all of myself into it again and maybe become a child again.

Several pre-service teachers discussed feelings of resistance to sharing personal stories with others, especially with classmates that they did not know. One student commented *I didn't really want to share it at first. People judge, and I felt like what are they going to say about my story?*

Another student indicated that telling her story made her feel a bit vulnerable; however, she valued the experience of sharing her story with classmates.

I found that by opening myself up to others, I learn more about others, and I can see that we all have those stories we hold within us. By sharing this story, I feel I have been able to better connect with the others around me, laughing off those moments that make us feel uncomfortable. It feels good to laugh these off, because that is what makes us more reflective individuals and more confident in ourselves.

Many students stated that the best part of the digital storytelling project was seeing the final product and sharing the digital stories in class. *You get a glimpse into everyone's life, even if it is just a small little part.*

#### *Use of the reflective writing process*

One pre-service teacher said that the digital storytelling project made her realize the value of the planning process in writing. *I'm not a very good planner, but I have started because of this class.* She also said that she used the storyboard as a planning tool. *It really did help to figure out what picture to put with what text. It helped to line everything up to see how everything was going to fit together.*

Another student started the writing process by brainstorming ideas. *I started by doing a sequential thing because it is a story; then I tried to identify where the high point would be and whether or not there was a conclusion.* She used the Microsoft Word storyboard template to organize her pictures. *I was kind of randomly choosing pictures from the Internet to go along with my story; then I was able to put them in a place and kind of see the order*

*I made a star chart with the senses and then wrote, edited, and thought about how pictures could accompany the story,* said a pre-service teacher. She started the project by thinking of a good story that she could write descriptively and with emotion.

I like the idea of storyboarding because it makes you analyze your piece of writing. It helped me get in touch with my story and really pinpointed the things that I was feeling because that is what I wanted to show in my pictures. You have to know which parts need to have more emphasis because digital stories focus more on showing than telling.

Another student indicated that she does not use a planning process when she writes. *When I write, I just go for it. I just kind of sit and let it flow.* She did use the storyboard to divide her narrative into

segments and link the words to images she located on the Internet. She said that the images definitely helped her to tell her story.

### **Digital artifacts**

Review of the digital stories using Scholes (1981) criteria for story indicated that all the digital stories in the fourth implementation had an identifiable plot structure. Most of the digital stories exhibited a clear link between narrative and images, and the images extended the meaning of the words. One student explained that she blended her colorful Paint drawings with the photographs by applying an overall effect to the video in Windows Movie Maker. *It was suppose to make it look like an older movie. I wanted it to feel like it flowed better, more consistent throughout the movie.*

Another student used images from the Internet to tell her story. She tried to unify her video by applying overall effect in Movie Maker. *It just helped to kind of connect images. In each of the pictures, there's a different person. They are all a little different.*

One student used Adobe Photoshop to blend images from the Internet with personal photographs. *I used the artistic brush work setting. I think it was pastels. I liked the idea of the photographs looking like a drawing, and I did not want to do the drawings myself.*

To indicate a transformation in the digital story, a pre-service teacher chose to go from sepia tone images to a black screen to a full color picture. *I wanted the last picture to be in color. It's a grey day and then everything changed. Now it becomes color.*

### **Class discussion**

As the digital stories were shown in class, a few students chose to make personal statements about their stories. One student told the class that it was a personal relief to share the real story of her proposal. She said that writing the narrative and putting the digital story together allowed her reflect on what occurred and tell the story honestly.

Another student thanked the class for applauding after her story was shown. She said that she didn't mean to make others cry, especially the practitioner, but she was very touched by their response to the story of her brother's death. She commented that she was a little nervous about telling a serious story, but it was meant to be a tribute to her brother.

One student shared that she enjoyed the project because she got to draw the images for her digital story. She commented that she loves to color, but does not often draw. For her, drawing the images was part of the reflective process and the most powerful part of the digital story project. Pre-service teachers learned about images in the picture storybooks. The digital storytelling project provided an opportunity to apply this knowledge and experience the pleasure of drawing.

During class discussion, the practitioner asked student what it meant to tell a digital story. Pre-service teachers commented that they don't usually have the opportunity to choose a topic or write about self. The digital story project let pre-service teachers become authors. One student suggested that children might be more interested in writing if they were encouraged to write about self. Students said that sharing the digital stories in class gave them an opportunity to know more about their classmates and created a community environment. They lamented that the digital storytelling project was at the end of the semester. Several students said that having a similar project at the beginning of the semester would help students get to know peers and encourage team work.

Some pre-service teachers voiced reluctance about using the digital storytelling project with early childhood students due to time constraints and some apprehension about their ability to manage a technology project with young children. Most students; however, were very enthusiastic about taking the digital storytelling strategy into a future classroom to teach writing and to motivate students by connecting the writing process to digital technology. They suggested that young students should draw images rather than search the Internet as drawing engages students in a creative process and avoids the dangers of Internet searches.

#### **Discussion of the Fourth Implementation**

Five instructional strategies were added during the fourth semester of the digital storytelling project: use of a story example to review literary elements and illustrate narrative structure; three mini-lessons to scaffold student learning; the requirement that students use a storyboard as a planning tool; the addition of reflection questions near the end of the project to encourage students to think about the digital storytelling experience; and a class discussion of the digital stories and the reflection responses.

Although students did not specifically talk about the value of the story example, the plot model or the mini-lessons in the reflection responses or the interviews, the researchers believe that these strategies provided an underlying structure to the implementation of the digital storytelling project and scaffolded students' learning experience. The strategies provided a visual and verbal review of prior content in a concise approach and established a shared vocabulary for discussing story structure during the editing process. The digital artifacts in the fourth implementation all tell a personal story indicating that pre-service teachers understood the definition of story and the concept of plot.

For most pre-service teachers, cutting down the story or limiting words is the most difficult part of the digital storytelling project. Discussion of Sandra Cisneros' (1991) use of explicit words to describe setting and convey the character's emotional state in the story *Eleven* helped students to understand that carefully chosen, specific words convey meaning, so that an author does not have to include so much description in a narrative.

In a future implementation of the digital storytelling project, the researcher would suggest that the practitioner discuss implementation strategies with pre-service teachers as they are introduced, so that students understand the strategies from both a procedural and a conditional perspective.

For the fourth implementation, the practitioner agreed to include the storyboard as a project requirement. The researcher believes that using the storyboard as a planning tool supported reflection in the planning process and increased pre-service teachers' understanding of the connection between words and images to convey meaning. Reflection responses and interview data revealed that pre-service teachers valued the storyboard as a thinking tool that helped them visualize the narrative, break text into segments, and link words to images. Review of the digital artifacts showed that use of the storyboard as a planning tool led to an increased sensitivity to the connection between words and images to convey meaning.

Responses to the reflection questions resulted in students thinking about the digital storytelling project as a strategy that they might use in a future classroom and also encouraged students to reflect on their feelings about what it meant to tell a personal story and share the story with an audience. The reflection responses provided better insight into how the digital storytelling project impacted students than

the post implementation answers. Students responded to the reflection questions online and had time to reflect and consider the project experience.

Pre-service teachers indicated that the digital storytelling project showed them a new way to teach the writing process and integrate technology into the classroom. One student said *digital storytelling not only combines writing and technology, but also follows the five steps of the writing process and allows students to share their work with peers*. Another commented *not only does this project ask participants to delve into their experiences and convey them by going through the writing workshop process, but it engages creativity by asking students to put together images and sound to strengthen that story*.

Pre-service teachers also indicated that the digital storytelling project was meaningful since they got to write about self, reflect on memories, and share personal experiences with classmates and others. *Telling my story meant sharing a big part of who I am and why this is who I am today* said one participant. Another said *I am really proud of my project because I think it is a very real reflection of one of the defining parts of my life*.

The class discussion took place at the final class of the semester. The period for discussion was limited because the practitioner also wanted to talk with students about the overall impact of the course on their learning as well as the digital storytelling project. Time was also required for students to complete a faculty evaluation.

In a future implementation, the researcher would suggest moving the class discussion forward one period, so that there is adequate time for students to discuss the digital storytelling project in terms of what it means to tell a story, possible consequences of encouraging students to share stories, and optional approaches for using digital storytelling in a future classroom.

## **Discussion of Results Over Four Semesters**

### **Educational issue**

This four-semester study began with the identification of a current educational issue in the United States, the quality of student writing, and consideration of the role of the university in training pre-service teachers to teach writing. A review of literature indicated that a gap exists between what is taught in many pre-service education programs and what new teachers are expected to be able to do in the classroom



(Pope et al., 2002). The researcher proposed digital storytelling as an effective method to teach the writing process and integrate English/Language Arts content with digital technology in the pre-service education curriculum; thus better preparing pre-service teachers to teach writing effectively and utilize digital technology in a future classroom.

### **Objective of the study**

The study attempted to identify instructional strategies in a digital storytelling project that best enhance pre-service teachers' valuing of digital storytelling as a method to teach the writing process; to consider how digital storytelling enhances pre-service teachers' valuing of the role that reflection plays in the writing process; and to explore how pre-service teachers' become more aware of the relationship between words and images to convey meaning. Results are organized to address the research questions.

### **Strategies to enhance valuing of digital storytelling to teach the writing process**

Instructional strategies used in the digital storytelling project as shown in Table 4, Instructional strategies over four semesters, were evaluated, modified, and refined based on discussion between the practitioner and the researcher at the end of each implementation of the study.

**Table 4** Instructional strategies over four semesters

<p><b>First Implementation (Fall 2007)</b></p> <p><b>Writing assignment:</b> The writing task required students to write a 200-500 word personal narrative in first person, present tense about a meaningful personal experience.</p> <p><b>Digital storytelling project rubric:</b> The practitioner used the project rubric to review the literary elements in class and provided student with the rubric as a guide to the project requirements. The practitioner used the rubric to grade the digital stories as they were presented in class.</p> <p><b>Digital storytelling handout:</b> Students received a one page handout that explained the digital storytelling construction and publication process.</p> <p><b>Virtual storytelling circle:</b> Students were required to post a story idea to the virtual storytelling circle on the class website. Using peer review techniques, each student replied to two postings with suggestions and comments about the story topic as a guide to the author.</p> <p><b>Conferencing:</b> The practitioner and the researcher conference with students in class and by e-mail to help students edit and refine narratives. They assisted students with the construction and publication of digital stories in the computer lab.</p>
<p><b>Second Implementation (Spring 2008)</b></p> <p><b>Writing assignment:</b> The writing assignment for the second implementation used Carter's (1993) suggestion of a focused writing prompt to write a personal narrative that represents a "well-remembered event" in your life."</p> <p><b>Order of implementation:</b> Initial focus on digital story examples and technology methods in the first semester lead students to concentrate on locating images in their photo albums or scrapbooks instead of writing about an important life experience. The researcher and the practitioner determined that the digital storytelling project should focus first on the narrative writing process; then on digital technology methods required to transform the narrative into a digital story.</p> <p><b>Virtual story circle:</b> Students were required to post a draft of a completed story in the virtual story circle instead of a story idea.</p> <p><b>Peer feedback in virtual story circle:</b> The practitioner reviewed peer feedback requirements in class. Students were guided to provide meaningful comments and to pose questions where the meaning of a story is not clear. All comments must be phrased in a positive, constructive manner.</p> <p><b>Interventionist conferencing model:</b> Atwell's interventionist approach to conferencing with students was adopted (Atwell, 1998). This approach is knowledge based; not rule based. The teacher provides expert demonstration and intervenes directly during conferencing telling writers what works and what does not work collaborating directly with students to revise their writing.</p>
<p><b>Third Implementation (Fall 2008)</b></p> <p><b>Increased emphasis on story structure:</b> We recognized a need to model story structure to reinforce elements of plot such as rising action, conflict, resolution or transformation. The practitioner used a modified version of the Freytag (1893) model to demonstrate story structure in class.</p> <p><b>Demonstration of storyboard use:</b> To encourage student to use the storyboard as a planning tool, the practitioner demonstrated use of a storyboard to design a digital story along with the review of digital technology required to construct a digital story.</p> <p><b>Change in classroom environment:</b> Due to a schedule conflict, classes 4, 5, 6 were held in the university student computing center, an environment that was outside the college of education and unfamiliar to many students. This caused a disruption in the social environment of the class and in the relationship between the practitioner and students during final story editing and the construction and publishing of the digital stories.</p>
<p><b>Fourth Implementation (Spring 2009)</b></p> <p><b>Addition of a story example:</b> Prior to class 1, students read a short personal narrative, <i>Eleven</i> by Sandra Cisneros (1991) and completed questions based on the narrative. The story <i>Eleven</i> was used in class to review literary elements and story structure along with references to the project rubric.</p> <p><b>Inclusion of three structured mini-lessons</b></p> <ol style="list-style-type: none"> <li>1. Mini-lesson: <i>What is a Story?</i></li> <li>2. Mini- lesson: <i>Using a Storyboard: Linking Narrative to Image to Tell Your Story</i></li> <li>3. Mini-lesson: <i>Making a Digital Story in Window Movie Maker.</i></li> </ol> <p><b>Storyboard added to the project requirements</b></p> <p><b>Class discussion:</b> The practitioner lead a discussion of the digital stories and reflections responses at final class period.</p>

Research questions 1 asked what instructional strategies in a digital storytelling project best enhance pre-service teachers' valuing of digital storytelling as a method to teach the writing process. Findings indicate that four instructional strategies in the digital storytelling were valued by pre-service teachers as methods to teach the writing process:

- Digital storytelling handout
- Virtual storytelling circle
- Interventionist conferencing model
- Storyboard as a reflective planning tool

#### ***Digital storytelling handout***

Over the four implementations of the study, pre-service teachers received a digital storytelling handout, *Making a Digital Story in Windows Movie Maker*. The one page handout provided a step-by-step guide to the constructions and publication of the digital story. Interview data indicated that the digital storytelling handout served as a useful guide as students moved from the text-based environment to using digital technology applications to construct the digital story. One student *said I would not have been able to do this project without that sheet of paper that told us how to do it.*

#### ***Virtual storytelling circle and peer feedback***

During the first implementation, pre-service teachers were required to post a story idea in the virtual storytelling circle and provide feedback to two postings with suggestions and comments about the story topic as a guide to the author. In interviews, pre-service teachers commented that feedback from other students was shallow and did not help to narrow ideas. At the start of the second implementation, the practitioner modeled appropriate feedback responses in class.

Beginning with the second implementation, students were required to post a completed story in the virtual storytelling circle and provide feedback to at least two classmates. Interview data indicated that the virtual storytelling circle became a valued source of support for students as they edited and completed their story drafts. The virtual story circle provided students with suggestions from peers about the content and structure of stories. The virtual circle also gave pre-service teachers an opportunity to practice

critiquing writing in a meaningful way, a skill that they will use in a future classroom. According to pre-service teachers, the opportunity to read many stories was the greatest benefit of the virtual storytelling circle. Reading other students' stories provided a useful way to compare individual writing styles and story topics and see how other students limited their story drafts.

### ***Interventionist conferencing model***

During the first implementation, the practitioner and the researcher conferenced with student during the narrative writing process to help them edit and revise their stories. After discussion and review of literature, the practitioner implemented the interventionist conferencing model in the second implementation. Using the interventionist conferencing approach, the practitioner provided direct feedback to each student by e-mail on the story draft posted in the virtual storytelling circle and conferenced with students in class to help them refine the narratives.

According to interview data, interventionist conferencing helped student to revise stories; eliminate unnecessary details, select specific words, stay in the present tense, and establish a clear conflict and resolution. One student reported that conferencing with the practitioner helped her focus her story and come up with a definite theme throughout and see how to use descriptive words effectively. She commented *I was able to see that I was repeating things in my story that didn't really need to be repeated.*

Working with the practitioner also served as a model for pre-service teachers on how to conference with students in a future classroom. One student said that it helped her to see how conferencing with a student actually works. Another pre-service teacher commented that she was not aware that a direct approach to conferencing was appropriate in the classroom. *I have always been taught that you just suggest.*

### ***Storyboard as a reflective planning tool***

Though some students used the storyboard as a planning tool in the first three implementations of the project, it was a requirement during the fourth semester. Using the storyboard as a planning tool actively engaged pre-service teachers in linking recorded narrative to visual components in a timed sequence to convey meaning to an audience. Review of post-implementation responses and interview data indicated that using the storyboard to support thinking as pre-service teachers constructed a digital story

increased pre-service teachers understanding of the relationship between words and images to convey meaning. One student said *the storyboard helped me decide what the words “looked” like*. Another student said that the storyboard helped her map out the story and look for the appropriate “pauses.” *It allowed me to think of the images I wanted to use and how these images could best convey my story.*

Review of the digital artifacts produced during the fourth semester demonstrated that using a storyboard as a planning tool better enabled pre-service teacher to understand the relationship between words and images to convey meaning. Most of the digital stories showed a direct relationship between the recorded narrative and the images that appeared on the screen. Each image extended the meaning of the words by providing visual details and context for the story.

### **Instructional strategies to structure the digital storytelling project**

Like the foundation of a house or the steel girding of a tall building, some instructional strategies provided structure for the digital storytelling project and helped to scaffold students learning, but they were not specifically recognized by students as strategies that enhanced their valuing of digital storytelling as a method to teach the writing process. These instructional strategies include the digital storytelling rubric, order of implementation, the writing assignment, the story example, the plot model, and the mini-lessons.

Though not noted by students, findings from a review of the digital artifacts and statements in the interview data from the first semester indicated that the order of implementation of the digital storytelling project and the structure of the writing assignment are instructional strategies that are important to the success of the project.

### ***Order of implementation***

During the first implementation of the digital storytelling project, the practitioner presented the writing assignment and showed examples of digital stories during the first two class periods. Students saw that digital stories combine a recorded narrative with images; however, they did not necessarily understand that images in a digital story are linked to narrative so that the images extend the meaning of words in the story. Many students based the selection of a story topic on photographs that they already had related to some meaningful event such as graduation or a basketball game; then wrote a story based on the

photographs. After reviewing the digital artifacts, the researcher and the practitioner determined that the digital storytelling project must focus first on the narrative writing process; then on the digital technology methods required to construct and publish a digital story.

### ***Writing assignment***

The writing assignment for the first implementation asked students to write a personal narrative in first person, present tense about a meaningful experience. Based on feedback from the interview data and a review of the digital artifacts, we determined that the assignment was too broad and needed to be more specific. A story revolves around an event, physical or mental, but an experience is not necessarily a story. The writing assignment for the second implementation asked students to write a personal narrative that represents a “well-remembered event” in your life.” Students were better able to relate the definition of story to the revised writing assignment.

### **Valuing the role of reflection in the writing process**

During the reading/writing workshop project, students learned about the five step writing process: pre-write, draft, edit, revise, and publish. They applied the writing process when they wrote a personal narrative as a response to the short novel *Sara Plain and Tall* by Patricia MacLachlan (1985). The digital storytelling project was designed to reinforce students’ understanding of the reflective writing process and transfer the process into the digital writing environment.

The second research question asked how digital storytelling enhances pre-service teachers’ valuing of the role that reflection plays in the writing process. To answer the question, the researcher looked at interview data over four semesters, pre-post implementation survey responses related to the planning process and reflection responses, as well as the digital artifacts. Findings indicate that digital storytelling enhances pre-service teachers valuing of reflection in four ways.

- Understanding of writing as reflective, multi-step process
- Appreciation for interventionist conferencing as a model and the editing process
- Comprehension of story structure
- Awareness of the impact of sharing digital stories with an audience

### **Understanding of writing as a reflective, multi-step process**

Interview data and pre-implementation responses indicated that many pre-service teachers do not use a reflective process in their own writing. In class they learned the steps of the writing process and applied the process in the reading/writing workshop project; however, students indicated that prior to the digital storytelling project they did not employ the reflective writing process in their own work. Pre-service teachers understood the steps of the writing process from a declarative and procedural knowledge perspective, but they did not internalize the method into a personal writing process. One student commented *before this class, I would just start writing. I didn't really go through the whole planning process. I would write and kind of revise it.* Another shared *I'm not a big writer. I just go pen to paper to essay; that's it.* One pre-service teacher explained *I think because we are college students, we think that we don't need to use the writing process, but you definitely do.*

Pre-service teacher stated that the digital story construction process helped them to understand story structure and the importance of the writing process. One student said that the digital storytelling project pushed students to revise.

The way we did it we had to focus on an event, and you had to be concise to convey that experience. It took a lot of revising to get there. It's easy when you don't have a word limit.

Finding from interview data and pre-post implementation questions indicate that pre-service teachers became aware of the value of the reflective writing process as they worked through the writing process within a supportive learning environment.

### **Appreciating interventionist conferencing as a model and the editing process**

Over the four semesters of the digital storytelling project, pre-service teachers said that the most difficult part of the digital storytelling project was editing the narrative and cutting down the word count. The writing assignment required students to write a personal narrative in approximately 250 words. Most first drafts were considerable longer, and students were compelled to go through a revision process to refine stories.

A pre-service teacher commented *I had so much written and so many words that I had to condense, and it was really hard, but it definitely makes a better story to have less words.* Another said *I*

*had the story. The problem was making it concise enough to fit. Cutting was definitely the hardest part for me. I have a problem with brevity.* For many pre-service teachers, interventionist conferencing with the practitioner facilitated the editing process and lead students to value the reflective nature of the writing process.

I did an outline of my story, and I tried to think back and write every single detail. It came out to be about over 700 words. I thought to myself, how am I going to be able to shrink it down to 250 words? I went to the teacher and together we went sentence-by-sentence, word-by-word. We started subtracting.

### **Comprehension of story structure**

Findings from interview data and post implementation questions indicated that working through the process of drafting, editing and revising the written narrative helped pre-service teachers to better understand structure in story and the importance of word choice. One student shared *the digital storytelling project put us in the position of writers and made us look at story structure in a different way.*

The drafting, editing, and revising process enabled students to see how the parts of a narrative come together to tell a story. Pre-service teachers became more aware of specific elements of story structure such as conflict and resolution, and they learned to eliminate details that did not support the development of the plot. One student commented *the storytelling process helped me understand story structure because you really had to pay attention when putting the story together.*

Pre-service teacher pointed out that digital storytelling is a process and working through the process helped students to understand story structure and the connection between words and images to convey meaning.

Digital storytelling is definitely a process. It really helped me to understand how illustrations can help better exemplify the text. I learned how you need to have a plot and author's style to truly grab the reader's/audience attention.

### **Awareness of the impact of sharing digital stories**

Findings from interview data and responses to reflection questions 1 which asked pre-service teachers what it meant to tell a personal story indicated that students enjoyed a writing assignment that provided an opportunity to revisit and reflect on a meaningful life experience and also allowed them to tell a personal story. One student said she valued the digital storytelling project because it gave her the



opportunity to reflect on past experience and express herself; a chance to tell her story and make others feel it.

*I value the actual story and how it relates to me and to others.* She shared

Other classes tell you to write a story about something, and it is not your story. You have to write a story about a dragon and a castle or something. People think...oh they're going to be school teachers. Let's have them write stories ....but then you have real life situations that everybody goes through .....not only are you happy because it is your story, but also other people can relate to you because some of those people have done the same things or experienced the same things or had those same happy moments.

Another student commented that the digital storytelling project would be appealing the kids because they get to express themselves. *They get to put what they like from an experience into a story.*

Many students stated that the best part of the digital storytelling project was seeing the final product and sharing the digital stories in class. *It was so cool to see all the work you had done finally complete and see the whole movie.*

### **Recognition of the relationship between words and images to convey meaning**

The third research question asks through constructing a digital story, how do pre-service teachers become more aware of the relationship between words and images to convey meaning. To answer this question, the researcher reviewed the digital artifacts and looked at interview data over the four implementations of the study as well as post implementation question 3 for the third and fourth semester which asks students to explain how they used of a storyboard to support thinking as they combined narrative with images. During all implementations of the study, students were provided with a storyboard template to use as a planning tool, but the storyboard was not a project requirement until the fourth semester.

During the story editing process, pre-service teachers edited and revised a draft to make the narrative concise. They had to focus on selecting specific words to convey meaning and eliminate unnecessary details; then they had to think about how setting, characterization and emotion could be shown through images. Findings indicate that students carried over the reflective writing process into the construction of a digital story and thereby became more aware of the relationship between words and images to convey meaning. Students had to reflect on the meaning of the written narrative in order to

break their writing into text blocks; they had to visualize what kind of image would extend the meaning of the words in each segment. They had to time the appearance of images on the screen to coincide with recorded narrative.

Interview data from the first implementation indicated that some students used a storyboard and demonstrated that they understood the connection between image and words to convey meaning. One student said *I didn't include as many details in my writing because I showed all the details through the pictures.*

Another student said that she planned out the images that she thought she would need to tell her story first; then wrote the words she felt that each picture required to tell the story. She actually mapped out the plan in a storyboard linking the images and the text to achieve the message that she wanted to tell.

During the second semester, a pre-service teacher said that you have to select pictures that actually depict what you are trying to say. Another explained that she connected the digital storytelling project to the picture story book project, the first project in the course.

I wrote the whole story first, and then I picked out which pictures I wanted to go with what phrases. Since I drew my own pictures, they were on note cards; I just turned them over on the back, and I wrote what words I wanted to go there.

During the third semester, a pre-service teacher shared her new understanding about digital stories.

In class we discussed illustrations in picture storybooks, and the teacher said how you read the story makes a difference in the story, but a picture storybook is not a production. It is a paper with visuals, that's the difference. And there's a world of difference between a paper with pictures and an actual production that has to all go together.

During the fourth iteration, the storyboard was a project requirement. On the post implementation survey, students indicated that they used the storyboard in several ways. Some students indicated that the storyboard helped to them to separate the narrative into sections. Others used the storyboard to organize the images and determining timing. Many students used the storyboard to link the text to images.

Review of the digital artifacts from the fourth implementation indicated that students who combined the reflective process that they used to edit and refine the written narrative with the use of a storyboard to select and organize images increased the quality and impact of their digital stories. There

was an increased use of special effects in the digital stories: washes to blend dissimilar images, color to convey change of emotional environment, and visual metaphors to extend meaning. Pre-service teachers valued the storyboard as a strategy in the reflective process to determine images and link those images to narrative. They also used the storyboard to structure digital stories in terms of order, timing and visual impact.

### **Valuing digital storytelling to teach the writing process**

#### ***Likert Scale Attitude Survey***

This study investigated pre-service teachers' valuing of digital storytelling as a strategy to teach the writing process. To evaluate pre-service teachers' possible change in attitude toward valuing digital storytelling as a method to teach the writing process, the researcher designed a Likert Scale Attitude Survey pre-post test which was administered at the start and conclusion of the project over four semesters. As previously discussed, the Likert Scale Attitude Survey was revised prior to the second and fourth implementations to better assess the impact of the digital storytelling project on pre-service teachers.

Results of the Likert Scale Attitude Survey as shown in Table 5, Likert Scale Attitude Survey paired sample t-test results over four semesters, indicated an overall statistically significant increase in the mean difference in students' attitude in three of the four iterations due to the implementation of the digital storytelling project. The researcher attributed the lack of statistical significance in the third implementation to confusion in the learning environment which disrupted interventionist conferencing with the practitioner as students were editing narratives and attempting to construct digital stories. Learners in supportive environments have high levels of self efficacy and self-motivation and use learning as a primary transformative force (Bereiter & Scardamalia, 1989).

**Table 5** Likert Scale Attitude Survey paired sample t-test results over four semesters

Implementation	Pre-test Mean (M) Standard Deviation (SD)	Post-test Mean (M) Standard Deviation (SD)	T-test (t)	95% Confidence Intervals	Effect Size (d)
First: Fall 2007 n=35	M = 90.20 SD = 8.87	M = 94 SD = 7.99	$t(34) = -3.27$ $p < .05$	-6.16 to -1.44	$d = .5$
Second: Spring 2008 n=53	M = 90.92 SD = 11.81	M = 99 SD = 7.86	$t(52) = 5.8$ $p < .05$	5.4 to 11.09	$d = .8$
Third: Fall 2008 n= 41	M = 95.7 SD = 12.7	M = 98.3 SD = 14.26	$t(40) = 2.03$ $p > .05$	.01 to 5.3	$d = .3$
Fourth: Spring 2009 n=59	M = 77.80 SD = 9.65	M = 81.73 SD = 10.01	$t(58) = -4.5$ $p < .05$	-5.67 to -2.19	$d = .6$

Revision to the questions on the Likert Scale Attitude Survey after the first implementation improved the wording of the questions. Revision after the third implementation eliminated questions that did not relate to constructs of interest: story and the writing process, images, computers and technology.

Finding from factor analysis of the Likert scale survey indicated that students' valuing of digital storytelling as a method to teach the writing process is related to understanding of the writing process and images and confidence with computers and technology. These two factors accounted for 38% of the item variance in the second implementation and 41% of item variance in the fourth implementation.

Findings related to instructional strategies indicated that interventionist conferencing, the digital storytelling handout, the virtual story circle, and the use of a storyboard were valued by pre-service teachers as strategies that supported students' understanding of the writing process and image and increase pre-service teachers' confidence related to the construct and publishing of stories in the digital environment.

#### ***Level of experience with digital technology***

To triangulate results of the Likert Scale Attitude Survey paired sample t-test data, the researcher looked at pre-service teachers' self-reported level of technology experience at the beginning of the project

and post-implementation responses about how pre-service teachers might use digital storytelling in a future classroom.

Findings from the interview data, implementation responses and the Digital Technology Applications Survey indicated that pre-service teachers over four semesters entered the digital storytelling project with a range of digital technology experiences. The highest reported level of experience was with word processing software followed by presentation software and spread sheet applications. Pre-service teachers also indicated a high level of experience with locating images on the Internet, down-loading digital music from the Internet, and the use of a digital camera. Lowest levels of experience were with digital technology applications that are used to construct a digital story such as audio recording, and video editing.

#### **Use of digital storytelling in a future classroom**

The majority of pre-service teachers in the digital storytelling project did not enter the project knowing how to use the digital technology applications that are used to construct and publish a digital story. Post-test implement survey question 3 asked students to indicate how they might use digital storytelling in a future classroom. Findings from interview data and post -implementation responses indicated that most pre-service teachers who participated in the digital storytelling project plan to use digital storytelling in a future classroom. Some indicated that digital storytelling is a way to make the writing process more appealing to students. Others suggested that digital storytelling would motivate students to write because they get to combine writing with technology and produce a movie they can share with other. A few students were reluctant to use the project because of concerned about administering the project in a classroom of elementary students. Findings suggest that understanding of the writing process and images as well as increased confidence with computers and technology led pre-service teachers' to value digital storytelling as a method to teach writing in a future classroom.

### **3. WRITING IN THE DIGITAL ENVIRONMENT: PRE-SERVICE TEACHERS' PERCEPTIONS OF THE VALUE OF DIGITAL STORYTELLING**

#### **INTRODUCTION**

Emphasis on state mandated and ISTE/NETS standards in pre-service education requires educational institutions to prepare pre-service teachers to be effective users of digital technology. Pre-service teachers must learn digital technology skills and also develop a valuing for digital technologies and an understanding of how to utilize digital technologies as tools for teaching and learning. "Technologies should not support learning by attempting to instruct learners, but rather should be used as knowledge construction tools that students learn with, not from" (Jonassen, Carr & Yueh 1998, p. 24). The focus should be on teaching with technology; not teaching about technology (Russell, Bebell, O'Dwyer, & O'Connor 2003). Technology integration is most successful when pre-service teachers view work as authentic, meaningful, and directly linked to instruction (Collier & Veres 2006; Sadik 2008).

The goal of teacher education is for pre-service teachers to be able to meaningfully use technology to support their curriculum (Robin 2006). Technology should serve as a supportive background for content in English/Language Arts (Shulman 1987). Teaching must build on what we know from research and practice; what we know about reading, writing, speaking, viewing and visually representing (National Council of Teachers of English, Standards, p. 1 as cited in Pope & Golub (2000). Teaching and learning English is the goal, and technology is the means through which we can reach that goal (Pope et al. 2000).

As pre-service teachers construct digital stories, they develop planning skills, learn to understand the relationship between words and images to convey meaning, and come to value digital technologies as tools for thinking, learning, and sharing ideas. Storytelling is not a new pedagogical approach, but the potential of digital storytelling to open new possibilities for teaching students to write effective narratives and to utilize computers to construct knowledge and communicate globally makes it a meaningful strategy for teaching and learning in the 21<sup>st</sup> century.

## **METHODS**

### **Research Design**

This study used a qualitative research paradigm to look for emergent patterns in pre-service teachers' perceptions of the value of adding a digital storytelling project to the curriculum of a writing intensive children's literature course. The two classes remained intact. All students received the same intervention as the researcher wanted to understand changes in attitude of individual students due to the introduction of the digital storytelling project; not group differences.

### **Research Questions**

This study attempts to understand pre-service teachers' perceptions of the value of adding a digital storytelling project to the curriculum of a writing intensive children's literature course. The digital storytelling project shifted the writing process from a text-based format to the digital environment that added visual and auditory components to the writing process and led students through an iterative, reflective cycle to develop a digital artifact that could be shared with an audience and also reflected on and evaluated by the author. Therefore, this study attempted to answer the following questions:

1. What aspects of the digital storytelling project result in pre-service teachers valuing digital storytelling as a method to teach writing and support instruction and learning in the classrooms?
2. How does engaging in a digital storytelling project help pre-service teachers' to better understand of the connection between the planning process in the text-based environment and the planning process in the digital environment?

### **Participants**

Participants in this study were pre-service teachers enrolled in two sections of an early childhood education course, *Teaching Reading through Children's Literature* at Texas A&M University (n = 67). The majority of these students were junior and senior early childhood education majors, although some students were secondary social studies or English majors. Pre-service teachers were predominately Caucasian (n = 61), with a small number of African American students (n = 2) and Hispanic students (n = 4). A majority of the pre-service teachers were female (66 female, 1 male; mean age = 21).

### **Program Description**

Research took place in a one-semester introductory children's literature course designed to prepare pre-service teachers to teach critical reading, language arts, and children's literature. The course was project-based and emphasized both competent writing skills and effective methods to teach writing to early childhood - 4<sup>th</sup> grade students. The digital storytelling project took place over a four week period. The instructor and the researcher conference with students in class to help with story editing and in the computer lab in two four hour afternoon sessions and in the evening by appointment during the production phase of the digital stories. The final class period of the project was used to view the digital artifacts as they were presented in the classroom. This research took place in a naturalistic setting, the classroom. The researcher took the role of participant-observer during the four week period of the digital storytelling project which allowed for interaction with pre-service students during the digital story construction process and for viewing all completed digital artifacts.

### **Project Implementation**

The digital storytelling project was the culminating project of the semester. The project drew on knowledge from prior projects: picture story books and oral storytelling methods, literary elements and narrative structure, and the reading/writing workshop process. The digital storytelling project endeavored to shift the application of this prior content knowledge into the digital writing environment and engage pre-service teacher in the development of a meaningful project that integrated digital technology with narrative writing and demonstrated how digital technology can be effectively utilized in the classroom.

The course was writing intensive; therefore the initial focus of the digital storytelling project was on effective narrative writing, not on a discussion of technology skills or software applications. The digital storytelling assignment as stated in the course syllabus:

Technology continues to become a critical tool in our society. As a result, it is impacting many areas of learning including both pedagogy and literature. You will be required to author a script (250-500 words maximum) and create a digital story/movie of your script using pictures, photographs, or another visual medium. Special attention will be given to your use of voice, purpose, and audience as well as the literary elements (plot, setting, characterization, conflict, author's style, and theme).



The digital storytelling writing task required pre-service teachers to compose a personal narrative in first person present tense in response to writing prompt. Write a 200-500 word personal narrative that represents a well-remembered event in your life. The personal narrative became the basis for the digital story. During the writing phase of the project, the instructor and the researcher conferenced with students in class to help them edit and refine their personal narratives. After students completed the writing task, they recorded their stories, with the help of a lab assistant, using Audacity, a free software program for capturing and editing audio. The recorded narrative established the framework for the digital story and shifted narrative writing into the digital environment.

Prior to the first class, students were required to read the short personal narrative *Eleven* by Sandra Cisneros (1991) and analyze the story in terms of the literary elements (plot, setting, characterization, conflict, author's style, theme). The instructor led a discussion of the story in class as a review for the digital storytelling project. Students were also provided with a rubric as a guide to the project requirements as shown in Appendix 3. This rubric was designed by the instructor and used by the instructor to grade the digital story projects as they were shown during the final class period. In keeping with the reading/writing workshop approach, three structured mini-lessons were presented in class by the instructor over three class periods.

1. What is a story?
  - Reviewed the definition of story and the literary elements
  - Used a structural plot model to demonstrate story structure
  - Illustrated story structure using the short story example
2. Using a Storyboard: Linking Narrative to Image to Tell Your Story
  - Showed a storyboard template
  - Displayed a completed storyboard
  - Discussed how a storyboard helps to link narrative segments to images
  - Presented the digital story constructed using the storyboard

### 3. Making a Digital Story in Window Movie Maker

- Showed two examples of digital stories
- Demonstrated adding the recorded audio and music to the movie track
- Demonstrated inserting images in the movie track and controlling timing
- Explained the publication process in Windows Moviemaker

Students were required to use a storyboard as a planning tool in the construction of the digital story. Chung (2006) states that the storyboard is a planning tool that helps students efficiently organize the development or evolution of a story and keeps the story focused in terms of timing, imagery, audio, and music. Students were provided with a storyboard template and given the option to use a digital storyboard in Microsoft Word format. Students were given the choice to draw images, use personal photographs and video, or locate appropriate images on the Internet using key word searches. Emphasis was placed on selecting images that extended the meaning of the narrative and supported the structural development of the story.

The instructor presented the mini-lesson on constructing a digital story using Windows Movie Maker after students completed the narrative writing task. She also showed examples of digital stories designed by other pre-service teachers to illustrate how recorded narrative links to visual representations to extend the meaning of words. Students received a one page handout, *Making a Digital Video in Windows Movie Make* designed by the researcher, which provided a step-by-step guide to the technical construction process for a digital story as shown in Appendix 4. Students in a pilot project indicated that the handout served as an excellent guide to the construction and publishing process. Based on experience from the pilot project, the researcher determined that discussion of technology and the digital construction process should not occur until the narrative writing task was completed. Initial showing of digital story examples and discussion of the technical construction process seemed to lead students to focus on locating images or photographs, rather than concentrating on effective narrative writing. The resulting projects were slide shows; not well written stories about a meaningful personal event.

## **Data Sources**

### **Experience with Digital Technology Applications Survey**

At the first class that related to the digital storytelling project, pre-service teachers responded to an Experience with Digital Technology Survey as shown in Appendix 7 to assess their entry level experience with digital technology applications at the start of the project. Students were asked to rate their experience level with digital applications on the basis 1 to 5 with 1 representing no experience and 5 representing a significant level of experience. No technology component was included in the course prior to the digital storytelling project. The digital storytelling project was the only project that required students to employ digital technology application beyond word processing and presentation software; thus the researcher wanted to understand pre-service teachers' self-reported level of experience with digital technology applications prior to any discussion of digital storytelling methods.

### **Pre-post implementation survey questions**

At the first class that related to the digital storytelling project, students responded to two questions in a short paragraph of three to five sentences.

1. Describe the planning process that you use when you are working on a writing assignment.
2. Why is it important to integrate digital technology training into pre-service education?

Pre-implementation survey questions explored pre-service teachers' views prior to beginning the digital storytelling project about the use of a planning process in a writing assignment and the importance of technology training in pre-service education.

At the start of the final class that related to the digital storytelling project, students responded to three additional questions.

1. Describe the planning process that you used to design your digital story.
2. How did the use of a storyboard support your thinking as you combined your narrative with images to create a digital story?
3. How do you anticipate using digital storytelling with students in a classroom?

Post-implementation survey questions 1 explored how pre-service teachers used the writing workshop planning process in the construction of a digital story. Questions 2 explored how students used

the storyboard as a planning tool to design the digital story. Question 3 looked at students' valuing of digital technology as a method to teach writing and integrate digital technology in the classroom. The researcher wanted to determine if pre-service teacher valued digital storytelling and the technology training in the project enough to suggest how they might use the digital storytelling project in a future classroom.

### **Reflection questions**

Prior to the final class period, students were asked to post responses to two reflection questions on the class web site. The purpose of the reflection questions was to engage pre-service teachers in thinking about the value of the digital storytelling project as a teaching and learning strategy.

1. How did engaging in the digital storytelling project change the way you feel about teaching the writing process in the digital environment?
2. What did telling your digital story mean to you?

The researcher wanted to understand how students perceived personal changes in attitude related to teaching the writing process in the digital environment that may have occurred due to the implementation of the digital storytelling project.

### **Individual interviews**

At the conclusion of the digital storytelling project, the researcher invited all students in both classes to participate in interviews related to the digital storytelling project. Interviews were planned to last no more than thirty minutes since the interviews were being conducted during the week just prior to final exams, and students were concerned about study time. Interviews used a semi-structured script to provide consistency in data collection as shown in Appendix 6. Interview questions focused on differences that students experienced when they moved from writing in a text-based format to writing in the digital environment that adds visual and auditory components to the writing process and results in a permanent artifact that can be shared with others and also reflected on and evaluated by the author. Specific areas of interest in the interview script included the writing workshop planning process, understanding of the relationship between words and images to convey meaning, valuing of the digital storytelling project as a teaching and learning strategy, and plans for using digital storytelling in the classroom.

Fourteen students initially volunteered to be interviewed; however, twelve students actually participated in the interview process. The twelve students constituted a purposeful sample, students who were willing to participate in a semi-structured discussion of the digital storytelling process and the impact of sharing a digital story with an audience (Patton, 1990 as referenced in Hoepfl, 1997).

Interviews were digitally recorded and transcribed by the researcher. The researcher sent each participant a copy of the transcribed interview by e-mail as a member check. The researcher asked students to read the interview transcript and report any misrepresentations. All students who replied indicated that the transcription fairly represented what was said during the interview. Names used in this study are pseudonyms to protect the privacy of pre-service teachers who were interviewed.

### **Story drafts, storyboards, and digital artifacts**

The researcher acted as a participant-observer during the digital storytelling project and was present when the digital stories were shown in class. The researcher also had access to the class website where story drafts were posted and to the storyboards and digital artifacts for review.

During the interview process, the researcher showed each student's digital story as a basis for discussing the narrative, story structure, and the use of images to extend the meaning of words. Bishop (2009) referred to this technique as *multimedia elicitation*, asking each pre-service teacher to view and respond to his or her own digital story (p. 38). Patton (2002 as referenced in Bishop 2009) described this as a projection technique in qualitative research: one that allows the participant to react to something other than a question. Viewing the digital stories with participants established a 'mutual visual context' for discussion that both the researcher and the pre-service teacher could respond to (Taylor 2002 as referenced in Bishop 2009).

## **Data Analysis Methods**

### **Experience with Digital Technology Applications Survey**

Students' self-reported entry level of experience in each digital technology application was totaled and averaged to provide an overview of the groups' level of experience with digital technology applications at the start of the digital storytelling project (n=64).

### **Pre-post implementation questions, reflection responses, interview data**

The researcher used emergent coding and employed the causal-comparative method of data analysis to categorize and analyze the pre-post implementation survey questions, the reflection responses, and the transcribed interviews to look for patterns and themes that may result in grounded theory (Glaser & Strauss 1967; Riessman 1993; Merriam 1998). All data analysis was conducted by the researcher.

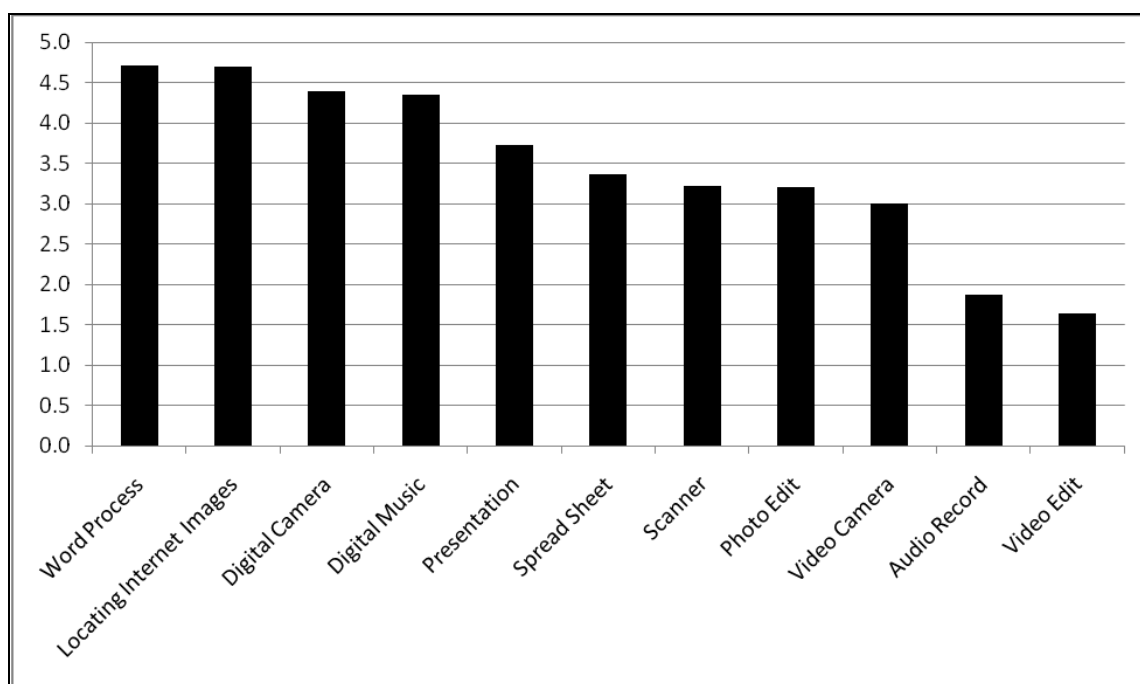
Each student was assigned an identification number, and all data were coded to protect student identity. The implementation survey questions, the reflection responses, and the individual interviews with study participants served to triangulate data sources; thereby increasing contextual validity (Diesing, 1972, p. 147-148 as referenced in Lincoln & Guba, 1985). Review of the digital artifacts and the storyboards served to triangulate interview data related to story structure and the use of images to extend the meaning of words.

## **RESULTS**

### **Establishing a Digital Technology Context for the Study**

#### **Experience with Digital Technology Applications Survey**

The Experience with Digital Technology Applications Survey reported pre-service teachers' average level of experience with digital technology applications. Results of the survey, as reported in Fig. 4, indicated that pre-service teachers entered the digital storytelling project with a range of digital technology applications experience. Pre-service teachers reported the highest level of experience with word processing software followed by presentation software and spread sheet applications. They also indicated a high level of experience with locating images on the Internet, down-loading digital music from the Internet, and the use of a digital camera. Lowest reported levels of experience were with digital technology applications that are used to construct a digital story such as audio recording, and video editing.



**Fig. 4** Pre-service teachers' average level of experience with digital technology applications

#### **Interview Data Related to Experience with Digital Technology**

Of the twelve pre-service teachers who participated in the interview process, all indicated that they had previous experience with word processing using Microsoft Word and presentation design employing PowerPoint. Three students mentioned learning to use Excel, a spread sheet program, in a statistics class. One student talked about having experience with photo editing, and one reported prior experience with audio recording. Four students reported that they had used Windows Movie Maker to design a short documentary in another education class. None of these pre-service teachers indicated that they had ever written and constructed a digital story.

#### **Attitude toward integration of technology training in pre-service education**

Pre-implementation question 2 asked why it is important to integrate technology training into pre-service education. Responses indicated that pre-service teachers included in the study held a positive attitude toward the idea of integrating digital technology training in the pre-service education. 100% of

pre-service teachers indicated that including technology training in the pre-service education curriculum is important.

Approximately 70 % indicated that pre-service teachers must learn technology skills in pre-service education in order to be prepared to successfully integrate technology in the classroom.

Children love technology, and I don't know how to use it.

It is important for us to learn technology, so we can teach our students.  
They are growing up in a world of technology. We need to know about it.

I am more than willing to use technology in my classroom as long as I know how to use it.  
Technology needs to be in the classroom. If I learn how to use the technology now, it will be much easier to incorporate it into my classroom later allowing for a smoother transition.

Approximately 30% pointed out that students in the 21<sup>st</sup> century live in a world of technology, and pre-service teachers must be able to effectively relate to students who view technology as a part of their daily lives and are already comfortable using technology in multiple formats.

Technology is taking over! Children in our classes most likely love technology and will be more involved if we use it in the classroom.

Technology is the new way! The students who are going to be in my classroom will have far surpassed the technology wave. They are probably more into it than me! It makes learning the more fun!

Technology surrounds us daily. It is important for students to feel comfortable with technology at a young age in order to be successful with it as an adult.

### **Valuing Digital Storytelling as a Method to Teach Writing and Support Instruction**

The first research question asked what aspects of the digital storytelling project resulted in pre-service teachers valuing digital storytelling as a method to teach writing and support instruction and learning in the classroom. Analysis of reflection responses and interview data indicated that pre-service teachers valued the digital storytelling project as a model for how to teach the writing process, as method for self-expression and for sharing stories within a community of learners, and as strategy for integrating digital technology into the classroom.

#### **Digital storytelling as a model for teaching the writing process**

As pre-service teachers engaged in writing personal narratives and constructing digital stories, they came to value the digital storytelling project as a model for how to teach the writing process. Pre-



service teachers came to understand the benefit of peer review by participating in the on-line virtual storytelling circle where students provided peer feedback on story drafts and shared story ideas. Conferencing with the instructor through e-mail and during the class period helped pre-service teachers edit and refine their written narratives and allowed them to experience the interventionist conferencing model as students. Engaging in the digital storytelling project also allowed pre-service teachers to consider how they might apply these methods in a future classroom.

### ***Valuing the writing process***

Reflection questions 1 asked pre-service teachers how engaging in the digital storytelling project changed the way you feel about teaching writing in the digital environment. Pre-service teachers said that the digital storytelling project made them more aware of the value of the writing process. They also indicated that the project motivated students to write and share their work with others.

Digital storytelling enhances all parts of the writing process. Before I always saw writing as something you just kind of do to turn in and get a grade. The teacher is the only person who really cares to read what is written. With digital storytelling, every part of the writing process matters. Doing this project gives students an incentive to complete the writing process because you want your story to be great. I also think digital storytelling greatly enhances the aspect of publishing your work. I personally wanted to show everyone my finished work. I would never have done this with a written paper.

Having to tell my story in such a few words made me aware of what is really important in a story; every word has to matter. This was a different way of writing than I was used to, and I believe it will help me as a future teacher in teaching a style of writing that is conscious of making every sentence in the story matter to the message of the story.

I think the digital storytelling process really helped me understand how to teach different writing techniques. I decided it's much harder to write 200 words than 2000! It really makes you see how to choose the exact words that convey what you want the reader to understand.

I had never thought about using movies as a medium for practicing the writing process, but I see now that it works really well! I think it would be a great way to engage students, especially boys, if they know that the story they are working on will be turned into a movie.

I really think that this project would be very beneficial to teach children about the writing process. It made the experience more fun, and the final product was worth the work! This is something that students will definitely want to show off to their parents, and is something they could reference back to when needed.

Out of the fifty-five pre-service teachers who responded to reflection question 1, three indicated that they would not feel comfortable using digital storytelling to teach writing in a future classroom. Two

had difficulty understanding how to use digital storytelling in a classroom curriculum; the third student felt that the project was not appropriate at the kindergarten level.

I had a hard time with the whole process. I know that the classroom is becoming more and more digital, but it changes every day, and I just don't think that I would use this in my classroom.

To be perfectly honest, it just confused me. I have no clue how I will teach this. I'm not sure what I expected out of this project, but I'm not really sure what I got out of this. Sure, I know how to use this awesome software now, which I'm totally excited about, but I don't know how to fit it into my curriculum.

I hope to teach pre-k or kindergarten in the future, so I don't think that I will be teaching about the writing process in the digital environment. I think that involving more technology in the curriculum is important for older students. They spend much of their time on their computers outside of school, so why not use their love of technology in the classroom?

Patterns in the interview data corresponded with the reflection response themes. Pre-service teachers indicated that they valued the digital storytelling project as a model for how to teach the writing process in the digital environment. These students also mentioned valuing the virtual storytelling circle as a strategy for peer review and sharing story ideas and interventionist conferencing as a method to help students to edit and refine a narrative. Students also brought up aspects of the digital storytelling project that they found difficult such as story selection and cutting down the written narrative to the word limit.

### ***Valuing the digital storytelling project to teach the writing process***

Cher said that digital *storytelling not only combines writing and technology, but also follows the five steps of the writing process and allows students to share their work with peers*. She stated that during the digital storytelling project pre-service teachers had the opportunity to go through the writing process to create a story in a supported learning environment. *We pre-wrote, and we drafted. That took the longest time for me to get the story to the right amount of words and to get it to where it had a rising action and a climax*. She commented that pre-service teachers worked on the digital storytelling project as students and explained that the digital storytelling project was a model for what her future students might go through as they try to write a story. *I think that working through the writing process really showed how important it is to have your story come out the best way. Your movie will reflect all the steps that you went through*.

Peggy said the digital storytelling project gave her an insight into how her future students will feel when she teaches the writing process. *The project forces you to be very intentional with every word*

*you use and how you illustrate the story and read the narration. The end result is a very compact, meaningful reflection of the author.*

Gretchen mentioned that she learned about the elements of the writing process in a previous class project.

But digital storytelling was good because we were supposed to write short and sweet which is what 4<sup>th</sup> graders are doing. It was great to see a model of how we can conference with students and help them and how they can help each other by reading their peer's work and reviewing it.

Sally stated that the digital storytelling project highlights the importance of the writing process and technology. *It takes all of those steps in the state standards. It highlights planning, writing, editing, and publishing, and technology, and it's fun. Maybe that is important to kids who think that writing is scary and boring.*

### ***Valuing the virtual storytelling circle***

Gretchen said that she enjoyed the virtual story circle because she likes getting feedback from peers about her writing and what she can do better. *I will think a piece of writing is fine, but then other people will notice things. It's different when you read someone else's writing versus your own.* She said that that two different people posted feedback to her story both telling her that she rushed the ending too much. She also mentioned that the virtual storytelling circle was a great opportunity to see everyone else's story.

The variety was just so great, so many different stories, and you got to relate to everyone personally, just peer to peer. In addition to just enjoying the reading, it helped to develop your story because you could get ideas from everyone else. You got to read as many stories as you wanted or the whole class. I just kept reading more and more. I read almost all of the stories because I really wanted to know what other people did. I was worried because mine was so long. Before I got my story down to 500 words, I went through and read all the stories just to see how they cut stuff out. It was good having those to look at.

Nan commented that reading other stories definitely helped her. *I think that was kind of an eye opener to read other people's stories. What I had was not it! Maybe the middle part was it, but I needed to get rid of the top and bottom.*

Leigh said that a big part of the writing process is getting feedback from others and hearing what works and what does not work. *You definitely have to step out of your own mindset for a little bit.*

For Rhonda the hardest part of the digital storytelling project was picking a topic. *I found ten different topics that I could have done. Either it was going to be too much for 250 words, or it just wasn't going to have a good plot line.* She said that the virtual storytelling circle allowed her to read many stories. *I read almost everybody's story. It helped me to think about my story. Only one person gave me feedback. Her feedback was actually good because I didn't realize that I was leaving out parts of my story.*

According to Peggy, reading other stories was kind of an encouragement. *You are not worried about your story being weird or not like what was expected. It helped to see where everybody else was going and the types of stories they were writing.*

### ***Valuing the interventionist conferencing model***

Cher stated that it is helpful when a teacher works with a student to make a product better. *When the instructor said you could do this, you could do that, it did not mean you had to do it that way. She was just suggesting.*

Peggy said that she liked hearing an honest evaluation of her story. *If something is not relevant to the story, like in mine, it was good to hear it. That helped me when I was thinking about refining the story.*

Gretchen mentioned that the instructor helped her to cut her story down. *I don't think I would have been able to do it on my own. I would read and read my story. It was hard for me to figure out what I could cut out.* Gretchen also said that she did not know that using interventionist conferencing was appropriate in the classroom.

I have always been taught that you just suggest. I want to be able to help my students with their writing. I feel like if I were to do this project again, I would do it so much better because of the help I received. It helped me to learn to write shorter, more concise stories. This project has been a model for teaching writing and especially for how you go about conferencing with students in the classroom. It has helped me to see how we can conference with students and help them; how they can help each other.

Wanda said that conferencing with the instructor helped her to narrow her focus and understand what would work and what wouldn't work. She commented *it's good to know that a teacher can intervene. I might worry about hurting feelings or stepping on toes. It's good to know that saying something will help out more than not saying something.*

Faye mentioned that conferencing with the instructor enabled her to better understand the meaning of conflict in story structure. *I just thought a story had to have a conflict or a solution. I didn't realize that in conflict something changes; then it is resolved.* Faye stated that revising to reveal the conflict in her proposal story made the story more difficult for her to share.

I wanted to say I was really uncomfortable, but I wanted it to be all about I was cold, I was hungry, it was raining; nothing about not wanting to be there. I didn't want to share that part. I didn't want his family to know I wanted to go home.

Mary Jane stated that a one-on-one, hands-on approach always works better for her.

When we are a whole class and the teacher says here are some guidelines, you really don't get the help you need. Some people can catch on, but other people are like what does she mean by this? I would rather have the teacher right there saying this is what I mean, or you need to do this or this could be better. I need someone to show me.

Lana pointed out that often students are concerned that their work isn't good enough, so being able to talk it over with an instructor helps them to get on the right track.

When someone does not let you know that you are not on the right track and then you finish; that's going to affect your grade. That's going to affect the final product, so it's better to find out early than too late. It really helped me being able to talk about what my ideas were.

Shanna said conferencing with the instructor forced her to get to another level of thinking about her story.

She gave me a couple of ideas. I kind of went off of her ideas. I just started going through and combined a few sentences, so I could take some stuff out. I ended up seeing some things that had nothing to do with the story. I cut them out. I really liked the end product.

Reflecting on the interventionist conferencing model, Rhonda said *it is an approach that I'm not used to. I think it is kind of a shock at first. You are used to people saying ... Oh, that's good.* She stated that the interventionist approach to conferencing is more straight to the point, and it helps student more. *It definitely saves time, and it gets you on the right track instead of letting you turn in something that is wrong and then getting graded down.* Even though Rhonda responded favorably to interventionist conferencing in class, she expressed reservations about using the approach with young children. *I am going to teach pre-k, kindergarten, first grade. They are just learning to write. You want to tell them what is right, but you also don't want to discourage them before they really even start.*

In interviews, pre-service teachers agreed that the digital storytelling project served as a model for teaching writing in the digital environment, but they also explained that finding a story topic and cutting the written narrative down to the word limit were difficult aspects of the project.

For Peggy choosing a story to tell was most frustrating part of the digital storytelling project; *just sitting there and not knowing what to write about*. Wanda agreed that coming up with a topic was frustrating. *I had too many ideas, and I couldn't narrow it down. It was hard just picking really short instances.*

Cher stated that writing the first draft of her story was the hardest part of the project, but cutting the written narrative to approximately 250 words was also a challenge.

Sally indicated that finding the right words was difficult. *I had the story, but making it concise enough to fit... Cutting was definitely the hardest part for me. I have a problem with brevity.*

Gretchen agreed that cutting her narrative down was difficult. *When I look back on it, I think that it was such a good experience. I need to learn to cut down on the fluff, the things that maybe aren't really necessary to the story.*

### **Digital Storytelling as a Method for Self-expression and Sharing Stories**

Writing a personal narrative, thinking about a meaningful personal experience, and sharing a digital story within a community of learners helped pre-service teachers to develop a greater sense of personal identity and voice. Reflection question 2 asked pre-service teachers what did telling your digital story mean to you. Analysis of responses indicated that pre-service teachers valued digital storytelling as an opportunity to tell a personal story and talk about self and as a chance to reflect on an important life experience. They enjoyed sharing the digital stories with classmates and learning about the life experiences of other pre-service teachers. Pre-service teachers also mentioned having a sense of accomplishment and pride in the digital artifacts that they constructed.

Similar themes arose from analysis of the interview data. Pre-service teachers revealed that the value of constructing and sharing a digital story is both intrinsic and extrinsic. They enjoyed a writing assignment that provided an opportunity to revisit and reflect on a meaningful life experience and also

allowed them to tell a personal story. Sharing the digital stories in class let students to bring to light identity events and to be present as individuals within the learning community.

Several pre-service teachers discussed feelings of resistance to sharing personal stories with others, especially with classmates that they did not know. Other students indicated that the process of writing the personal narrative and sharing the story with classmates allowed them to come to terms with past experiences. Results of the reflection responses and interview data are addressed by themes.

### **Telling a personal story**

I loved having the opportunity to write a story that is important to me while practicing the writing process. I really enjoyed telling my story. It was a very big moment in my life and for the rest of the band that year. We continued to talk about that competition for the rest of our band careers, and people still talk about it today.

To me, telling my digital story meant that I could relive a moment. While writing my story, I got the same butterfly's in my stomach that I had over seven years ago. I used my words to explode the moment and share a little bit about who I am.

The story about getting my horse is truly the beginning of a new chapter in my life, so I enjoyed getting to tell it. My horseback riding truly defined a part of my life and changed my teenage years. I never played a high school sport; I rode my horse and competed. Because of this, my high school years were different from many people, and I think it makes me special!

Mary Jane valued the digital storytelling project because she got to tell her personal story. *It was my story in my voice. It reflected my feelings. This project allowed me to dig deep and find a moment in my life that I know is unforgettable.* Mary Jane was particularly touched by the way her story affected other students when her digital video was shown in class.

Not only are you happy because it is your story, but also other people can relate to you because some of those people have done the same things or experienced the same things or had those same moments like me.

Mary Jane said that reflecting on her brother's death was a very emotional experience that she learned from.

I didn't think that I was going to be that touched by it. I just thought I was telling a story that happened five years ago. Retelling the story kind of brought me back to when I first found out. It brought me all the way back to the first stages of dealing with it, kind of like reconnecting to the whole thing. It was good in a way. I guess I learned that I wasn't as over it as I thought I was. I also learned that I could actually tell the story and do a good job of doing it and have people feel like I felt even though they didn't go through what I went through. I think that was a good experience.

Rhonda commented that her story meant more than what people think it means. She said that watching her video in class was cool.

You are like... Oh, that's my story. I can't believe it. I think kids would love that. I know I got a kick out of seeing mine and everybody else's. You are like... it's just something new. It's way more interesting than writing another paper and getting it back with red ink.

Rhonda told a story about making a personal decision to transfer as a junior to her father's alma mater, Texas A&M University. She talked about the impact of sharing her digital story with her father by posting it on YouTube.

If you could have seen the reaction... like my dad cried. I have never seen my dad cry. My story means a lot because it's like so much of who I am. It's not just about me. It's about my family. It's a huge thing in my family... being an Aggie. My granddad was here during World War II. He went off and fought and came back and graduated. I'm the first girl cousin. I have a huge family, but none of the girls have ever gone to A&M, but all the boys have. I am really close with my granddad too. He's 84. He won't know what this is, but he will like it. My grandmother will love it too.

### **Reflecting on experience**

My story is important to me because it shows exactly who I am; shy and quiet until you get to know me. I don't remember a whole lot during my kindergarten years, but this is one memory that has stuck with me forever. After the writing and digital story process, the overall "lesson learned" in my story has opened my eyes because sometimes I am still very much like the child in the video; scared and maybe sometime too quiet. I should really speak up and give more of my opinions especially in class.

I enjoyed being able to tell my digital story because it was fun to think back on memories of my whole family at our favorite vacation spot. Even though my story is something that was really terrifying to me when I was a child, looking back on it only makes me reflect on how my Dad was there for me then, and how he and the rest of my family will always be there for me.

My digital story is a prominent memory of myself in first grade. I enjoyed sharing it because it just shows how much innocence you have when you are six years old. Now if I took some Tootsie Rolls from someone, I might not feel that guilty. I would probably somehow justify my actions, but back then, the guilt I felt was all I could think about.

Peggy said that telling her story brought back good memories. *It's been three years since I danced.*

Sometimes when you are just going through life, you kind of forget about some of the sweet things about growing up. It was just really nice to remember; just thinking about it and remembering that was a huge part of my life ... being who I am.

Sally told a childhood story about catching insects with her brother. She stated that a lot of people are not aware of her childhood fantasies of becoming an etymologist.



The best part of the digital storytelling project was reliving the memory; cherishing every bit of it because it forced me to relive that moment in such exquisite detail that I was able to put all of myself into it again and maybe become a child again.

### **Sharing digital stories with others**

Telling my digital story meant sharing a piece of my life with everyone. Just being in class with people doesn't mean you are necessarily going to get to know them, more than just their name. This project really helped to allow the class to share a part of who they are, and I think it is going to be great for bonding and really becoming a team in the classroom.

At first, I felt somewhat uncomfortable sharing personal things with people I don't know well. After finishing the project, I feel really proud of the original event as well as the way I told it in my story. I think it is a good way to share something unique about yourself as well as express feelings and emotion. It is an easy way for students to share their writing in an unconventional manner without the embarrassment of standing in front of the class and reading the story.

My favorite part about this project was that you can truly make it your own. I love that it is something that you can show to family or friends and something you can keep forever. I feel really good about my project and sharing it with those around me was a moment I will never forget.

Cher said that the best part of the digital storytelling project was seeing the final product and sharing the digital stories in class. *You get a glimpse into everyone's life even if it is just a small little part.* She commented that the digital storytelling gives students the freedom to talk about self and to choose what they want to share. *I think that what deters kids from writing is that they don't get to talk about what they want.*

Gretchen stated that she enjoys sharing everyday anecdotes friends. She commented that digital storytelling provided a more creative way to tell stories, and it allowed her to share with the whole class. She also liked hearing other students' stories. *There are people I sit next to every day, but I didn't know that they were the prom queen, or volleyball champion, or track star. It was neat to see the array of personalities and experiences in our class.*

Shanna told a story about an embarrassing teen experience. She commented that she kind of liked revealing her embarrassment.

Obviously no one is perfect. I know some of the people in the classroom. Others, I don't know. It was fun for me to share my embarrassing moment with people I do know. For others, it was a kind of segue of knowing a little bit about me. It felt good. I laughed at it when I watched it again.

Faye chose to tell her proposal story. She said that sharing the story in class made her feel like she was actually being real.

A lot of people didn't know about how I wanted to get on the plane and go right back home 30 seconds before he proposed. Everyone was like tell me about the proposal. I'd say we were in a castle. He said I love you; I cried. I never would have shared all the other stuff. I felt like I had exposed myself and was honest about it. It kind of felt good to get that off my chest.

Nan valued the opportunity to share a personal narrative with classmates because it let others know more about who she is as a person, but she also indicated that telling a personal story is a little intimidating. *I'm not very open with people. I love people, but people judge. I felt like what are they going to say about my story?*

Nan mentioned that she choose a story that she felt comfortable sharing with classmates.

Sharing about my first job experience as a dance teacher for disabled kids tells a lot about who I am. It made me feel as if people got to see a little part of me. Even if other students don't relate to my story or feel the same way I felt, they actually did see a part of me.

Like Nan, Lana indicated that telling her story made her feel a bit vulnerable; however, she valued the experience of sharing her story with classmates.

I found that by opening myself up to others, I learn more about others, and I can see that we all have those stories we hold within us. By sharing this story, I feel I have been able to better connect with the others around me, laughing off those moments that make us feel uncomfortable. It feels good to laugh these off, because that is what makes us more reflective individuals and more confident in ourselves.

### **Developing a personal voice**

Getting to tell my digital story really allowed me to incorporate my own tone and voice easier. I struggle sometimes to let my own voice and tone be evident in my writing because I am trying to "follow the rules," but this allowed more freedom. I really liked getting to put my own personal touches with the pictures because that also added tone when my words did not say it all. Telling this story digitally really made the process more personal and helped me tell the story the way that I really remember it.

I really enjoyed getting to choose the words I wanted to visually illustrate. I also enjoyed getting to narrate my story using my voice and getting to emphasize the words I wanted allowing my emotion and feeling to show through my expression.

Telling my story was very difficult at first because of narrowing it down to the core. But once I did, I felt like I actually owned that story. I owned those words and that moment in my life. I could actually step back in time and recreate the emotions I felt. It was like it happened all over again.

### **Pride in the digital artifact**

My digital story telling project was a very personal account. It was a powerful time in my life, and I loved that I could express those emotions in a video. I think the short story is really powerful, and it leaves room for other to think about the situation and what it must have been like to be in those kinds of situations.

At first it was really hard to think of a topic that I wanted to talk about, but after that it all fell into place. I really liked being able to express my story in a new way. The pictures really add to the voice and helped with imagery. It was really fun to watch all the movies and hear all the stories. It feels good to be able to publish a story using technology.

For me, digital storytelling was a new way to express myself and a significant event in my life. It was nice to be able to tell a story in a different way, instead of writing a paper. I enjoyed using digital technology to express myself.

Gretchen admitted that she was a little embarrassed when her digital story was playing in class, but later she felt proud of her efforts.

It's personal sharing your story, your voice, the way you choose to depict your story. But afterwards, I was like that was good. I was proud of it. I am more comfortable sharing it with my mom and my friends. Oh, look at this project that I have done. People are like ... that's a really cool project. I wish I had done that in school.

Nan showed her project to her roommate and her best friend. *I was like... You've got to see this. I'm kind of proud.*

Mary Jane was nervous about how other students would react to her digital story about the death of her brother, but she said that the feedback that she received from other students and from the instructor after class was the most rewarding part of the project.

I just want to tell you that your story was really, really good. I really enjoyed it. I was like thank you. I didn't mean to make people cry. I thought I was going to get a good grade on it, but I guess I didn't think it was going to affect people like it did. I didn't think it was going to affect people deeply.

### **Digital Storytelling to Integrate Digital Technology in the Classroom**

The digital storytelling project actively engaged pre-service teachers in the construction of a digital story in a supportive learning environment. Participating in the project helped pre-service teachers to feel more confident about using digital technology and enabled them to envision how they might apply digital technology methods in a future classroom.

Analysis of the reflection responses and interview data showed similar themes. Pre-service teachers indicated that the digital storytelling project increased their confidence level with using digital

technology applications. The project demonstrated a new strategy for teaching writing and showed pre-service teachers a method for integrating digital technology in a future classroom.

### **Increased confidence level with technology**

Engaging in the digital storytelling project has allowed me to come in touch with many different types of technology and has showed me multiple possibilities that I can incorporate in my classroom. It has really eased my hesitation about incorporating technology into the writing process.

I feel more comfortable using technology, and think this will be useful in the classroom. I would have never thought that the writing process could be done through the digital environment. It incorporates writing and technology, and kids will enjoy this process. It is a different accomplishment being able to publish and share their stories.

When I first heard about the requirements for this project, I was horrified at the thought of making a movie using my own narrative. After my movie was on the communal hard drive, I realized that the project ended up being a lot easier than I expected. It was maybe not something that could be used in a kindergarten or first grade classroom, but could definitely be used in the upper elementary grades. This project has made me realize how drastically different the writing process is in this day and age. I never even used a computer to write any sort of stories when I was in elementary school.

Nan stated that the digital storytelling project helped her to overcome a fear of technology.

At the start of this project, I was intimidated by the task of making a movie all on my own. I now see that the project is definitely one that I am capable of doing, and also using as a teaching tool for my future class. Kids in this generation are much more technology savvy than we are, and they may perhaps be more engaged in the writing process knowing that they get to use the computer to publish their writing.

Shanna admitted that she was scared of digital story telling project because she had never used Moviemaker. *But now that I have used it, I thought it was very simple. I would use it again.*

Rhonda said that hearing about the digital storytelling project in class made her nervous. *I didn't know what the software was or anything. For my age, I'm really not good with technology. But once I saw that you just drag and click; I can do that.*

### **Digital Storytelling as a New Strategy for Teaching Writing**

I think that digital storytelling is an innovative and fun way for teachers to teach different concepts in all subject areas. I think students would enjoy listening and watching a digital lesson rather than listening to a teacher talk about it. It is a different way to teach and get the concepts through to all students in different and fun ways.

I found that the more we know about technology the more we will be able to show and interest the students we will teach. This project shows children how to pre-write effectively, so that their story comes across effectively. It also gives them a change to use graphics and voice in their work.

After going through the process of writing and publishing my story, I see the value and significance this project has. I think it is important as teachers to think of new and creative ways of expressing our stories and experiences with our students. Since technology is advancing and taking new roles in the classroom, I think it is important as educators to give children the opportunity to use technology and express themselves in new ways.

At the beginning of the digital storytelling project, Sally had doubts about using computer graphics and sound to accurately convey the written word. *I felt that perhaps such an activity would detract from the very nature of the narrative itself.* She indicated that going through the digital storytelling process changed her mind about teaching writing in the digital environment.

Not only does this project ask participants to delve into their experiences and convey them by going through the process of the writing workshop, but it engages creativity by asking students to put together images and sound to strengthen that story. I realize that we are in a growing age of technology where students encounter computer-based programs every day. What better way to incorporate a technology than thorough a fun and still highly academic product. No more are the days of simply writing a passage and illustrating it with markers and crayons.

For Leigh, the most significant value of the project was getting to use computers. *Even the title of the project Digital Storytelling was exciting to me. Technology is the wave of the future. Being able to embrace that in a college class was valuable to me.* Leigh particularly liked the visual aspect of digital storytelling and sharing her digital story in the classroom. *I just liked being able to make my story into something that other people could watch. The most fundamental part of this project was that people could see my story, literally see it and not have to read it.*

### **Integrating technology into the classroom**

Before this project, I was confused as to how to integrate technology into the classroom. Now I believe I have a great tool at hand. I found the digital storytelling project very informative and innovative. It can be used as a fun and interesting spin on the writing process in the classrooms. My students hopefully will be excited to write and practice the writing process as they get to produce digital masterpieces.

Technology can be very intimidating and by experiencing this program and creating a fun story, it has allowed me to be more comfortable with implementing this into a classroom. By combining audio with a well written story, it really makes a story completely different from just a book with words.

This project is a great way to combine technology and writing. Classrooms today have student who are way over my head with technology, and it showed me a great way to connect the two. I think it will be really exciting for children to experience and take their work even further.

Cher stated that she would definitely plan to use digital storytelling in a future classroom; however, she indicated that the process might be difficult for elementary students. She commented that with modifications digital storytelling would be a good way to incorporate technology and writing together, and it would be especially motivating for students who are not that interested in writing.

If you could transcribe their stories and put them into a computer, they would definitely be able to draw their own pictures. They do that all the time; draw representations of their own lives and their own stories.

Cher commented that school kids would probably have an easier time coming up with story ideas than the pre-service teachers in her class.

For a kid, it is definitely not as hard. They have stories like that all the time. They come into class, and they will just tell you about anything. They are so excited about any small story.

Gretchen liked the idea of using Photo Story3 for younger grades for writing poems or little stories with only a few images to give students experience with combining writing, art and technology.

If I taught 4<sup>th</sup> grade, I would definitely use this in my classroom. It's really a great tool. It is a little tedious at the beginning, but I know how much kids love drawing and art work. Making an actual movie is really cool. Kids get the hang of things very fast just by watching.

Leigh hopes to use the digital storytelling project with gifted and talented students.

Digital storytelling would get them to think out of the box. I would focus on the storyboarding. In my mind, that's what makes this project different; not just the fact that you are turning a few lines into a picture. It just makes you think differently about your story. It makes you focus on how images affect mood and meaning.

Lana liked the idea of using the digital storytelling to develop a documentary.

The first digital story that I made was a documentary, and I really, really enjoyed how we presented the information and made it seem more interesting, more powerful. I also think it would be important first to do it for practice as a class and then maybe in small groups. I don't know that I would ever ask students to do this on their own.

Sally stated that until she is more comfortable in the classroom and able to see how much time the project would take with certain age groups, she would probably use digital storytelling as a kind of final project. Sally shared that her goal is to teach writing.

I want my students to be writing everyday; to be writing about their experiences. Maybe they choose their most important experience or one that has had an impact on them; then publish it and make it into a movie night, a time when parents can see the project.

Mary Jane suggested that she might construct a digital story as a personal introduction; *kind of showing the class who I am*. She also mentioned having students work in groups to make a movie about the whole class. *We could have a movie night with the parents.*

Like Mary Jane, Wanda also liked the idea of creating a class movie to share with parents. *I like the idea of doing a class project where each student does one or two slides*. She suggested that combining journaling with the digital storytelling project would help students to come up with story ideas. *When you journal, you often write three or four pages just on one little incident. I think that might be a good way for student to come up with ideas by looking back through their journals.*

Faye liked the idea of making a movie about herself to play on the first day of school like an introduction. *I think that would be more effective with younger kids than me standing up there saying...this is my name and this is where I grew up.*

Shanna suggested using digital storytelling as a “get to know me project” at the beginning of school to learn more about each student and also to incorporate the writing process.... *to see where students are and then maybe do it at the end of the year to see the change.*

Rhonda plans to use digital storytelling as a group project with young children. *Maybe more like a documentary. The parents would just love it if you showed them at the first, then in the middle, and at the end.* She commented that it was good for her to see that the digital technology required to construct a digital story not too difficult.

I’m from a really small town, a 2A school. In my school, we had computers, but we just did PowerPoint, Word, and Excel. Also I have not had any technology classes at Texas A&M University. I had never seen a Smart Board until this semester ever!

### **Using Digital Technology in a Future Classroom**

Post-implementation question 3 asked how do you anticipate using digital storytelling with students in a classroom. Responses were consistent with themes expressed in replies to reflection question 1 and the interview data. Most pre-service teachers indicated that they would use digital storytelling to teach the writing process. They stated that combining technology with the writing process would motivate students to write. They suggested using digital storytelling as a group project both in language arts and social studies. Of the sixty-three pre-service teachers who responded to post-implementation question 3,

only three students indicated that they were not sure they would use digital storytelling in a future classroom.

#### **Using digital storytelling to teach writing**

I think I would use digital storytelling with my student to encourage reluctant writers to dive into the writing process with the promise of making a movie.

I can use my digital story as an example and use it to teach the 5 step process. I would love to have my students create their own digital stories to learn more about them and teach them about the writing process.

I think it would be a great project for students to choose a story or idea they care about and add drawings to make a digital story. I remember making books when I was in elementary school, and I feel like this is a modern version of making books.

#### **Using digital storytelling to motivate students to write**

I would use digital storytelling mostly as a motivational tool to get students into narrative writing and sharing work with peers. It is a fun way to incorporate technology into that classroom that I feel student would enjoy. It also seems very beneficial even across grade levels.

I plan to have my students write stories about their families and summer vacations. I can really see how this could motivate students to write.

I think it will give students a motivation to write stories worth publishing. I think it could also really help when used within content areas.

#### **Other classroom application for digital storytelling**

I anticipate using it if I have an older elementary class. I think having groups of students come up with a story and work on it together would be a positive experience. Making a story as a class and constructing it together would be fun too!

I plan on being a language arts or social studies teacher. In English I could use this just as we have done and in social studies let student illustrate and tell different stories from history such as Lewis and Clark.

I would like to use digital storytelling as a means to introduce my future students to each other as a get to know me activity at the beginning of the school year. I may use it to tell stories to my students or have my class write a story to make a video together. In an older classroom, I may possibly have my student make their own video.

### **Connecting the Planning Process in the Text-based Environment to the Digital Environment**

The second research question asked how engaging in a digital storytelling project helped pre-service teachers to better understand the connection between the planning process in the text-based environment and the planning process in the digital environment. To answer this question, the researcher



looked at responses to pre-post implementation question 1, related to the use of a planning process in writing, and to post-implementation survey question 2, related to use of a storyboard in the digital story planning process; then at interview data.

Findings indicated that many pre-service teachers do not generally apply the five step writing workshop planning process in their own writing unless it is a project requirement; however, most student employ some elements of the reflective writing process. Responses indicated that students became more aware of the value of the reflective writing process as they worked through pre-writing, drafting, editing, and revision in a supportive environment.

Results also indicated that many pre-service teachers in the study used the storyboard as a strategy for thinking about the connection between words and images and as a method to sequence and time images in the digital story. As pre-service teachers worked through the writing process, drafting, editing and revising a personal narrative and then used a storyboard to plan the construction of a digital story, they came to better understand the connection between the planning process in the text-based environment and in the digital environment

### **Using a Planning Process in the Digital Storytelling Project**

Pre-implementation question 1 asked pre-service teachers to describe the planning process they use when working on a writing assignment. Analysis of responses indicated that approximately 20% of the pre-service teachers who responded to the survey do not use a planning process when they work on a writing assignment (n=63).

I'm pretty bad about planning. I will sit at my computer and write it.

Honestly, I don't plan. I just write what's on my mind.

I do not normally plan writing unless it is a part of my grade.

I plan in my head. It is difficult for me to write a plan down. It feels like once you write it down, you're stuck.

Other responses showed that approximately 40% of pre-service teachers used some form of planning process when they work on a writing assignment. Pre-service teachers mentioned a variety of strategies such as brainstorming, webbing, outlining, bulleting key points and rough drafting to develop a

writing assignment. Approximately 40% of the pre-service teachers indicated that they use all the steps of the writing workshop planning process when they work on a writing assignment.

Post-implementation question 1 asked pre-service teachers to describe the planning process that they actually used to design a digital story. Analysis of responses indicated an increased use of the planning process as pre-service teachers constructed digital stories. 95% reported using some kind of a planning process, with 65% indicating that they went through all five steps of the writing process. 5% of pre-service teachers stated that they did not use a plan. (n=63).

#### **Reported no planning process**

Writing the story was my main planning tool. Once the story was complete, the digital elements fell into place.

I just went for the story and wrote as if I was living in the moment. I had a difficult time deciding on a topic, but managed to do okay once I had it picked out. Once that was done, I allotted time for the technology aspect of the project and with help, I did okay.

When the idea for my story came to me, I went with it. I am really not a pre-writer and so my pre-writing here was an afterthought. I know that might not be the best way, but that is the way it works for me.

#### **Reported using some form of planning**

Coming up with a story I could use was difficult. I jotted down main ideas for the event; then created what I remembered.

I thought about memorable moments in my life. Once I decided on an idea, I wrote a brief outline of what my story would be.

I wrote down all my thoughts in a list. I pretty much just wrote down everything I could remember that happened. I then put it in paragraph form and cut it down from there.

#### **Reported using the 5-step writing process**

I brainstormed a story that I could remember well and jotted down some memories. I wrote my draft and then revised it after I got feedback. I recorded it and then organized my storyboard and found pictures. After all the information was there, I compiled it using Window Movie maker.

I brainstormed various events to use as a subject and chose one of the events and then began drafting. I then began to revise my draft, and I did this numerous times. I recorded narration and began choosing images. After this, I dropped them all into the Moviemaker and was done.

I first wrote down the events that happened and completed a rough draft. A peer edited my story; I condensed it down a little more. Once in the computer lab, I realized it needed to be even shorter and managed to tighten my story by eliminating unnecessary parts.

### **Using the Storyboard as a Planning Tool to Construct a Digital Story**

Using the storyboard as a planning tool actively engaged pre-service teachers in linking recorded narrative to visual components in a timed sequence to convey meaning to an audience. Results of post implementation 2 indicated that using the storyboard to support thinking as pre-service teachers constructed a digital story increased pre-service teachers understanding of the relationship between words and images to convey meaning.

Post-implementation question 2 asked pre-service teachers to discuss how they used the storyboard to support their thinking as they combined narrative with images to create a digital story. Pre-service teachers reported that they used the storyboard to link images with narrative segments. The storyboard also served as an organizational tool to determine how many images would be required to tell the story and to break up the text into segments. Responses indicated that approximately 8 % of pre-service teachers in the study did not use a storyboard in spite of the fact that it was a project requirement.

#### **Using the storyboard to link images with narrative segments**

Helped me decide what the words "looked" like.

It helped me see the narrative and the images more clearly, and the visual allowed for organization. I liked the storyboard and how it put the project in order to complete the movie. Mostly it was beneficial to see the narrative and match images that corresponded

I'm a very visual person so combining my words and pictures on storyboard was very useful. I tried to look for pictures before hand and found I couldn't put them in order until I used a storyboard.

I liked it because it helped me think out the pictures that I would be using and how they would affect my story. It really helped me plan effectively.

#### **Using the storyboard to organize elements of the digital story**

The storyboard helped me to organize my text with the images I was planning to use. It was a great outline and tool that gave me a better insight into what the video would look like.

It helped me map out my story and look for the appropriate "pauses" when I split up the text. It allowed me to think of the images I wanted to use and how these images could best convey my story.

The storyboard helped me break up the text and decide where to use my pictures and which ones would work best.

### **Did not use a storyboard**

I honestly did not create a storyboard. I found it pretty easy to place my pictures on the line that I wanted to use and then adjust the time as necessary.

I did my storyboard after my movie was complete. I only did it because it was required.

I didn't use a storyboard worksheet. I did not like the layout. Instead I just wrote notes on my final draft.

## **Interview Data: Planning and Use of a Storyboard and Recording Narrative**

### **Planning and use of a storyboard**

Lana readily admitted that she does not generally use pre-writing strategies or a planning process when she writes. She commented that she created the storyboard after the fact to turn in; however, she did use a planning process to design her digital story.

To really figure out my images, I had a printed copy of my story just on a piece of paper...just written out in paragraphs. I took a pencil and put a dash at the end of certain segments, and then I wrote above it the picture that I wanted to go with those words.

Lana mentioned that the one thing that did change for her during the digital storytelling process was learning the power of personal illustrations.

At first I did my digital storytelling with pictures from a Google search, but when I viewed my project, I didn't really like it. I decided to try my hand at creating my own illustrations. My personal illustrations put so much more depth and power into my digital story.

Lana said that the pictures were her favorite part of the project. *I know they could have been stronger, and I could have put more time and effort into them, but that was probably my favorite part because that really tied it all together.*

I knew what I wanted my pictures to look like when I started drawing. I could see them in my head. That's how I knew what I wanted because I was thinking about it. I guess I do a lot of that kind of thing internally instead of externally.

Nan also indicated that she did not use a planning process to write her story. *When I write, I just go for it. I just kind of sit and let it flow.* Nan did use the storyboard to divide her narrative into segments and link the words to images she located on the Internet. She said that the images definitely helped her to tell her story. *They brought out what I really meant to portray.*

Rhonda said that the digital storytelling project made her realize the value of the planning process in writing. *I'm not a very good planner, but I have started because of this class.* Rhonda stated that she did

use the storyboard as a planning tool. *It really did help to figure out what picture to put with what text. It helped to line everything up to see how everything was going to fit together.*

Sally started the writing process by brainstorming ideas. *I started by doing a sequential thing because it is a story; then I tried to identify where the high point would be and whether or not there was a conclusion.* She used the Microsoft Word storyboard template to organize her pictures. *I was kind of randomly choosing pictures from the Internet to go along with my story; then I was able to put them in a place and kind of see the order.* Sally commented that the storyboard also helped to divide narrative. *I was able to space out the vocalization according to the images. I was able to put the text with the image and make sure that it matched.*

Leigh began the project by thinking of a good story that she could write descriptively and with emotion. She made a star chart with the senses and then wrote, edited, and thought about how pictures could accompany the story. She indicated that the only difference she found between the digital environment and the text-based writing process was the addition of the storyboard.

I like the idea of storyboarding because it makes you analyze your piece of writing. It helped me get in touch with my story and really pinpointed the things that I was feeling because that is what I wanted to show in my pictures. You have to know which parts need to have more emphasis because digital stories focus more on showing than telling.

Peggy commented that the difference in writing in the digital environment was thinking about the story as you write and considering what pictures you need to illustrate the story. She indicated that the storyboard helped her to decide how many pictures she needed and where to put them. She also said that the storyboard helped when she was actually making the movie. *I actually found an excess of pictures on the Internet that I would have liked to use. It was good to help me decide which ones would really capture that part of the story.*

Cher commented that the storyboard was a good way to sort of piece out the narrative into the sections of the movie.

You kind of saw how it was going to transition, and you also got a chance to figure out what would connect best with the words in that piece, so that you could have an image that really matched and represented what you wanted through the writing.

She mentioned that finding the right images on the Internet took a lot of time because Google does not always provide images that fit with the story. Cher commented *without the images, your narrative would have to explain, so that someone could picture the image in their head; maybe not the exact image, but to get enough detail, enough elaboration so you feel like you are there.*

Wanda used the storyboard template, as shown in Fig. 5, to break the written narrative into blocks and determine the images that would be required to tell her story, *Lesson Learned*. *I sketched the storyboard and that helped me visualize my digital story and make sure that it was in order.*

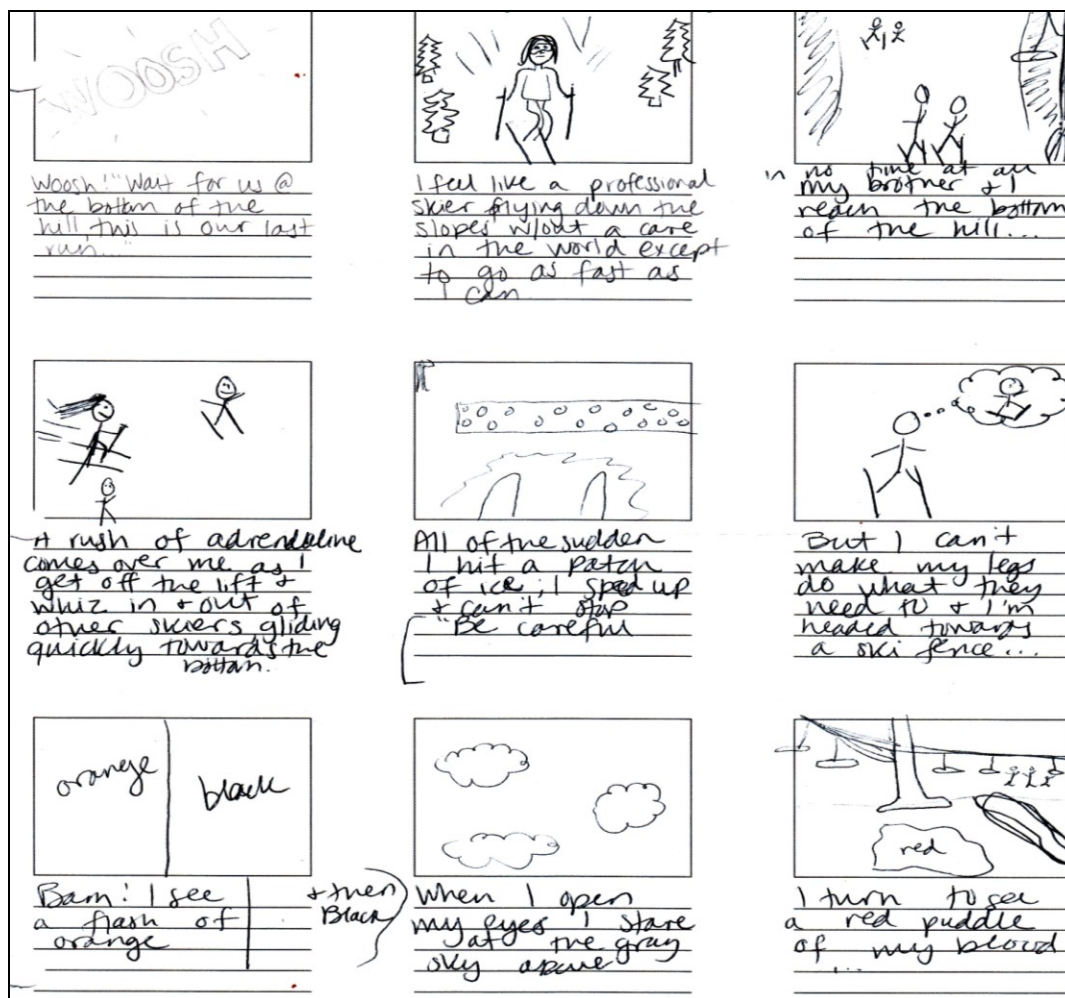
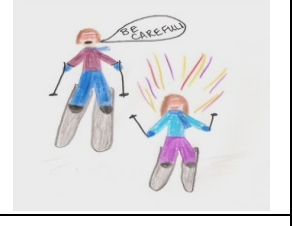


Fig. 5 Storyboard with preliminary sketches for *Lesson Learned*

Next Wanda drew the pictures for her digital story, as shown in Fig. 6, because she couldn't find images online that really fit her story.

Drawing it out helped me to put the images that were in my head onto paper. The storyboard also helped me to break down when to pause on the video because I had that mental image of what it would look like. Adding images made the story not rely on the words as much. The images showed what I was trying to say, so I didn't have to worry about adding as much description.

			
WOOSH! "Wait for us at the bottom of the hill. This is our last run." My mom's words trail off as I ski past.	I feel like a professional skier flying down the slopes without a care in the world except to go as fast as I can.	In no time at all, my brother and I reach the bottom. "Let's go again. I bet we'll still beat everyone else down the hill," I say.	A rush of adrenaline comes over me as I get off the lift and whiz in and out of other skiers, gliding quickly towards the bottom.
			
All of a sudden I hit a patch of ice. I speed up and I cannot stop myself.	"BE CAREFUL," I barely hear my mom scream.	But I can't make my legs do what they need to, and I'm headed towards an orange ski fence!	BAM! I see a flash of orange
			
... and then black	When I open my eyes, I stare at the gray sky above me. "Are you okay?" a man asks.	I turn to see red puddles on the snow beside me. "OWWW!" My mouth feels like it's full of needles.	Why did I go so fast? It took a mouth full of blood for me to learn to be careful.

**Fig. 6** Storyboard with hand drawn images for *Lesson Learned*

Gretchen said that she had never used a storyboard before the digital storytelling project. She commented that the storyboard helped her to split the story up and determine where she needed images.

I made my storyboard, but I ended up having to go back a couple of times to add a couple more images. The text was too long, so the picture just dragged on for ever. I just went back and added another box and split up the text, and it worked fine.

Gretchen pointed out that she combined images from Google with her own drawings done with Microsoft Paint. *I think drawing the pictures is a great way to incorporate the arts into the classroom. This project combines the writing process with art.* Gretchen explained that she blended her colorful Paint drawings with the photographs by applying an overall effect to the video in Windows Moviemaker. *It was suppose to make it look like an older movie. I wanted it to feel like it flowed better, more consistent throughout the movie.*




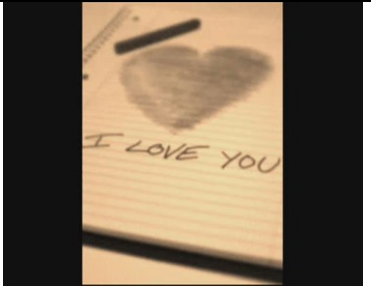


Peggy used images from the Internet to tell the story of her last dance recital. She tried to unify her video by applying overall effect in Moviemaker. *It just helped to kind of connect images. In each of the pictures, there's a different person. They are all a little different.*

Sally used Adobe Photoshop to blend images from the Internet with personal photographs. *I used the artistic brush work setting. I think it was pastels. I liked the idea of the photographs looking like a drawing, and I did not want to do the drawing myself.*

Faye said that the storyboard, as shown in Fig. 7, allowed her to associate images with the text. She indicated that she planned to include three pictures from the actual event, and she wanted to use color to convey mood in her story. She also wanted to use a visual metaphor to open the story, a weed to represent her dismal mood.

I knew that it was a grey story. I decided to go with a sepia tone, plus some of my pictures were a little blurry because of the resolution. The sepia helped because it took away from the fact they were blurry.



		
<p>I fight the groan that is prying its way out of my mouth. I am cold, wet, hungry, in need of a shower. Jet lag slowly spreads up my body like a weed.</p>	<p>I wonder if his family even wants me on their family vacation. They would probably be happy if I were not here, stealing the attention from their precious son. I shouldn't have come to Germany. I wish I could go home.</p>	<p>"I just want to look around a little more," my boyfriend says. Impatiently, I let him lead me to the ledge of the castle. He looks out at the gray, foreign land. "We've had a lot of firsts on this trip," he says. I nod in agreement. "How about another one?" Cautiously, I look him in the face. What is he up to?</p>
		
<p>"I love you," he says. Tears pierce the back of my eyes. For two long years, I have waited to hear those words from him, words being saved for his future wife. "I love you too," I manage to peep out. Tears start spilling down my face.</p>	<p>He gets down on one knee. He pulls out a ring. My ring. "Faye Smith, I love you. Will you marry me?" Tears pour down my face without restraint, dissolving all my fears. I see everything through new eyes.</p>	<p>This is my new family... my vacation now.</p>

**Fig. 7** Storyboard for *Welcome to Germany*

To indicate a transformation in her story, Faye chose to go from sepia tone images to a black screen to a full color picture. *I wanted the last picture to be in color. It's a grey day and then everything changed. Now it becomes color.* Faye commented that the best part of the digital storytelling project was when her video came together.

I watched it, and I felt like this is it. The color and the timing and all the little effects made it. I remember having goose bumps. I could not have dreamed of it working out so perfectly. Just watching it, I felt like this is how I really wanted my story portrayed.

## DISCUSSION

### Establishing a Digital Technology Context for the Study

Findings from analysis of the Digital Technology Applications Survey and interview data suggested that most study participants were already familiar with a variety of digital technology applications that they employ in other university courses and for personal use when they entered the digital technology project, even if their knowledge of digital applications required to construct a digital story were low.

Pre-implementation responses and interview data also indicated that study participants favored the inclusion of technology training in pre-service education, so that new teachers would be better prepared to enter the classroom and meet the needs of students who already use digital technology in their daily lives.

According to Rakes & Casey (2002), having a positive attitude toward technology is not enough to bridge the gap between pre-service education and successful integration of technology in a future classroom. “Even teachers who hold positive attitudes toward technology may have difficulty transferring these attitudes into productive actions” (Rakes & Casey, 2002, p. 1).

As I reviewed the pre-implementation responses, I was drawn to several quotes that reflect pre-service teachers’ feelings about why technology training is important in pre-service education.

Children love technology, and I don't know how to use it.

It is important for us to learn technology, so we can teach our students.  
They are growing up in a world of technology. We need to know about it.

If I learn how to use the technology now, it will be much easier to incorporate it into my classroom later allowing for a smoother transition.

As I listened to the voices of the pre-service teachers, their request seemed clear. *Teach me how to use digital technology in the classroom, so I am prepared to meet the needs of my future students.*

Rakes and Casey (2002) suggest that technology training in pre-service education is often thought of as skill acquisition instead of a change process that affects the behavior of individuals and provides students with effective methods to transfer strategies into the classroom.

The digital storytelling project focused first on the writing to immerse pre-service teachers in the steps of the reflective writing process; then taught pre-service teachers the technology skills to transfer the narrative to the digital environment. Introduction of the storyboard as a planning tool showed pre-service teachers with a new way to think and enabled them to match images with words to extend meaning. Publication of the digital stories and sharing them with an audience allowed pre-service teachers become authors.

### **Valuing Digital Storytelling as a Method to Teach Writing and Support Instruction**

Findings from analysis of the pre-post implementation questions, the reflection responses, and interview data indicated that the opportunity to working through the process of designing a digital storytelling in a supportive learning environment from drafting a narrative and going through the editing and revision process to constructing and publishing a digital story on the computer provided new insight about the value of a reflective process in writing.

Though pre-service teachers learned the steps of the writing workshop process in a previous project, the digital storytelling project actively engaged students in applying the writing process. Several students pointed out that they had never used the steps of the planning process before, but due to this project they saw the importance of going through each step. Recurring statements in the reflection responses indicated that pre-service teachers recognized that the digital storytelling combines writing with technology and helps students to see the value of each part of the reflective writing process.

Interventionist conferencing with faculty during the drafting and editing process helped pre-service teachers limit and revise their narratives and demonstrated how teachers can go about helping student improve their writing. Students said that the experience served as a model for how to teach writing and improve student performance.

The construction and publication phase of the digital storytelling project introduced pre-service teachers to new digital technology skills. Interventionist support from faculty scaffolded the experience and made pre-service teachers feel more comfortable with the process. Several students mentioned that the teacher' support helped them overcome fear of using digital technology in the classroom. The opportunity for pre-service teachers to be exposed to new technologies while learning teaching practices in their

methods courses and seeing the technologies modeled by faculty increases pre-service teachers' levels of confidence in utilizing technology (Pope et al., 2002; Adamy & Boulmetis, 2006, Brown & Warschauser, 2006).

Many students said that the best part of the digital storytelling project was seeing the final product and sharing the digital story with others. The stories allowed students to reflect on past experience and to be present as individuals within a community of learners. Benmayor (2002) says that a digital story project provides a context for sharing experiences with others and an opportunity for thinking about self (Weis, et al. 2002).

A few study participants expressed initial reluctance to share a personal story; however, they liked the option to select a story that they felt comfortable sharing. Pre-service teachers explained that having the opportunity to choose what they wanted to write about and speak in a personal voice motivated them to work on the project. They also enjoyed being able to tell stories using digital technology rather than just writing another paper and have the experience preserved in a permanent artifact. Many students commented that they felt really proud when their stories were shown in class.

Pre-service teachers went through the digital storytelling project as students. Analysis of the post-implementation responses indicated that most pre-service teachers plan to transfer the digital storytelling project into curriculum in future to classroom engage students in the writing process, motivate students to write, and to integrate digital technology in the classroom. Heo (2009) says new teachers are more likely to integrate technology in the classroom when they become competent with technology during pre-service training.

### **Connecting the Planning Process from Text-based to the Digital Environment**

Although a few students still hung to "I just write; I don't plan," post-implementation responses and interview data showed that most pre-service teachers used the reflective writing process as they worked through pre-writing, drafting, editing, and revision in a supportive environment and as a result, better understood how to teach writing in a future classroom.

For the most part, pre-service teachers had never used a storyboard. Working with the storyboard was a new way to think and plan. Many students found that the storyboard extended the reflective writing

process and helped them to make the transition from text-based writing to the digital environment.

Students reported using the storyboard to break narrative into blocks; then link the words to images to extend the meaning of the words.

Review of the digital artifacts indicated that students were able to successfully connect their words with images. Some students even utilized photo editing effects to blend images. Not all students used the storyboard in spite of the fact that it was a project requirement. For students who worked through the process of breaking the narrative into segments and linking the words to image, the storyboard served as a reflective thinking support, a meditational tool that connected planning in the text-based environment to the digital environment.

### **Changing Students' Perception of the Writing Process**

Finding from the interview data reveal that faculty modeling played a key role in changing pre-service teachers' perception of the value of the writing process. Describing the steps in the writing process and talking about conference with students is not enough. Faculty must commit to working individually with students to demonstrate how the editing and revision process works to improve writing. When pre-service teachers work through the writing process as students in a supportive learning environment, they come to value the steps of the reflective writing process.

### **Bridging the Gap from Pre-service Education to Technology Integration**

Constructing a digital story for the first time can be very frustrating. Most students in the digital storytelling project did not have any experience with technology applications needed to construct a digital story. The storyboard served as a reflective planning tool to help students link narrative to images; however, the teacher and the researcher supported students as they recorded audio, imported images to the computer, and placed images on the video track. Having faculty help is essential to students' initial success with digital story construction and publication. Confidence with digital technology develops as a result of learning new skills in a supportive environment.

### **Connecting Curriculum Content to Technology**

Pre-service teachers must first understand the elements of the English/Language Arts curriculum such as story definition, plot structure, and the literary elements before they are guided to connect this

curriculum to digital technology applications. Structural supports such as a story example, the review of literary elements, the project grading rubric, and the inclusion of mini- lessons help to support learning as student write the personal narrative scaffold the learning experience.

The digital storytelling project has the potential to engage pre-service teachers in an effective, meaningful way to use technology in the language arts classroom; however, faculty must place the initial emphasis in the digital storytelling project on narrative writing; not on technology skills.

#### 4. SUMMARY AND CONCLUSIONS

This dissertation identified the quality of student writing in the United States as a serious problem facing educators, university training programs, and society in the 21<sup>st</sup> century. Pope, Hare, Howard (2002) state that a gap exist between what is taught in many pre-service education programs and what new teachers are expected to be able to do in the classroom. Teacher education programs must provide pre-service teachers with the opportunity to learn teaching methods that demonstrate how to integrate digital technology with curriculum content. The ability to develop innovative technology-supported pedagogy lies in pre-service teacher' interpretation of the newly learned technology's value for supporting instruction and learning in the classroom (Hughes 2005).

This study proposed digital storytelling as an effective method to teach the narrative writing process and integrate English/Language Arts content with digital technology in pre-service education curriculum to better prepare pre-service teachers to teach writing effectively and utilize digital technology in a future classroom.

The first study endeavored to determined instructional strategies in the digital storytelling project that best enhanced pre-service teachers' valuing of digital storytelling as a method to teach the writing process; to consider how digital storytelling enhances pre-service teachers' valuing of the role that reflection plays in the writing process; and to explore how pre-service teachers become more aware of the relationship between words and images to convey meaning.

Findings indicate that four instructional strategies in the digital storytelling project supported pre-service teachers' understanding of the writing process and the relationship between words and images to convey meaning and helped to increase pre-service teachers' level of confidence related to constructing and publishing stories in the digital environment: the digital storytelling handout, the virtual storytelling circle, the interventionist conferencing model, and use of the storyboard as a reflective planning tool.

Pre-service teachers indicated that they became aware of the value of the reflective writing process as they worked through the writing process within a supportive learning environment. Results showed that digital storytelling enhanced pre-service teachers' valuing of the role that reflection plays in

the writing process in four ways: understanding of writing as a reflective, multi-step process; appreciation for the editing process and interventionist conferencing as a teaching model; comprehension of story structure; and awareness of the impact of sharing digital stories with an audience.

Study results suggest that understanding of the narrative writing process and images as well as increased confidence with computers and technology led pre-service teachers' to value digital storytelling as a method to teach writing in a future classroom.

The second study considered aspects of the digital storytelling project that resulted in pre-service teachers valuing digital storytelling as a method to teach writing and support instruction and learning in the classrooms. The study also investigated how engaging in a digital storytelling project might help pre-service teachers' to better understand of the connection between the planning process in the text-based environment and the planning process in the digital environment.

Findings indicated that as pre-service teachers engaged in writing personal narratives and constructing digital stories, they came to value the digital storytelling project as a model for how to teach the writing process, as a method for self expression and for sharing stories within a community of learners, and as a strategy for integrating digital technology in the classroom. Use of a storyboard as a reflective planning tool supported increased understanding of the connection between the planning process in the text-based environment and the planning process in the digital environment and the relationship between words and images to convey meaning.

### **LINKING CONTENT TO DIGITAL TECHNOLOGY**

Pre-service education programs must teach digital technology skills along with content and pedagogy. University faculty must model the use digital technology methods in the classroom and engage pre-service teachers in curriculum-based projects like digital storytelling that demonstrate how to link curriculum content to digital technology. The transition to the digital environment must be scaffolded, so that pre-service teachers have a positive learning experience with digital technology that leads to increased confidence with computers and digital applications.

Study results indicated that pre-service teachers' understanding of the writing process and their confidence with computers and digital technology increased as a result of the digital storytelling project.



The narrative writing content was presented first; then the practitioner modeled the digital construction process needed to make the transition to the digital writing environment. Engaging in the digital storytelling project enabled pre-service teachers to envision how they could integrate narrative writing with digital technology. Pre-service teachers commented that digital storytelling would motivate students to write because it combines writing with computers and allows students to share stories with others. By the end of the semester, pre-service teachers were suggesting curriculum applications in English/Language Arts and social studies for using digital storytelling in a future classroom.

### **MODELING INSTRUCTIONAL STRATEGIES IN PRE-SERVICE EDUCATION CLASSES**

Pre-service teachers must be able to link content knowledge with teaching pedagogy. University training programs must model the use of instructional strategies for pre-service teachers and explain their application. Pre-service teachers in the digital storytelling project learned the steps in the writing process in the reading/writing workshop project: pre-write, draft, edit, revise, publish. They all knew how to write, but many students did not have the skills to edit and refine own their writing, and most admitted that they did not employ the reflective writing process in their work. The practitioner modeled the editing process as she worked with pre-service teachers to help them revise; select specific words, combine sentences, eliminate unnecessary details, and stay focused on the plot. Findings showed that pre-service teachers began to value the reflective writing process when they experienced the importance of each steps in the process.

In addition study data revealed that most pre-service teachers did not understand how to conference with students to help them revise writing. The practitioner modeled interventionist conferencing as she worked individually with students in class and through e-mail on the virtual storytelling circle. Pre-service teachers experienced the value of interventionist conferencing as they worked with the practitioner to revise their own narratives. Observing the conferencing process allowed pre-service teachers to visualize how they can work with students in a future classroom to improve their writing.

## **ENGAGING STUDENTS IN STORYTELLING AND TECHNOLOGY**

If schools want the quality of student writing to improve; then pre-service teachers must be prepared to design writing assignments and projects that relate to the visual, verbal world that students experience in daily life: television, e-mail, texting, video games, the Internet, computers, Facebook and Twitter. Storytelling is a fundamental part of teaching; a way to share knowledge and experiences and capture the interest of students. Writing is an essential skill for communication in both the text-based environment and the digital environment. Results indicated that telling a personal story and sharing that story with other through digital technology was the best part of the digital storytelling project. Pre-service teachers who engage students through digital storytelling effectively connect storytelling with digital technology.

## **IMPLICATIONS FOR PRE-SERVICE TRAINING PROGRAMS**

The goal of teacher education is to prepare pre-service teachers to enter the classroom prepared to use digital technology effectively to support curriculum and improve student' achievement. Pre-service teachers must have a positive view of technology and be comfortable with using technology before improved student achievement can occur (Sadik, 2008; Rakes & Casey, 2002). Pre-service teachers must learn to use technology to support their curriculum and view technology as an integral part of teaching, an effective way to deliver curriculum; not as a separate component (Robin 2006).

The digital storytelling project is about much more than just writing a personal narrative and learning new technology skills. Digital storytelling is a process of engagement with writing, storytelling, and learning how to construct curriculum with digital technology. It is change process that affects the behavior of pre-service teachers as they experience a teaching method that motivates students to write, publish, and share stories and links the narrative writing process to digital technology.

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## APPENDIX

### 1 Implementation Procedures and Rationale for Change

First Implementation (Fall 2007)	Rationale for Change in Implementation Strategies for Spring 2008
<p><b>Research questions:</b> Determine the educational benefit of moving from writing in a text-based format to writing in the digital environment. Investigate pre-service teachers' valuing of digital storytelling as a method to teach the writing process and the effectiveness of strategies used in the implementation of the digital storytelling project.</p> <p><b>Implementation Strategies Fall 2007</b></p> <p><b>Writing assignment:</b> Writing task required students to write a 200-500 word personal narrative in first person present tense about a meaningful personal experience.</p> <p><b>Order of implementation</b></p> <p><b>Class 1 &amp; 2</b></p> <ul style="list-style-type: none"> <li>Practitioner showed examples of digital stories</li> <li>Practitioner discussed the elements of digital storytelling</li> <li>Practitioner demonstrated the technology required to record the narrative and construct a digital video</li> <li>Practitioner used the project rubric to review the literary element and provided student with the rubric as a guide to the project requirements. The practitioner used the rubric to grade the digital stories as they were presented in class.</li> <li>Students received a one page handout on how to construct a digital story and a handout detailing the elements of a digital story.</li> <li>Students worked in class to develop a story idea using the writing workshop process and had time to conference with the practitioner.</li> </ul> <p><b>Before Class 3</b></p> <ul style="list-style-type: none"> <li>Students were required to post a story idea to the virtual storytelling site on the class website.</li> <li>Using peer review techniques, each student replied to two postings with suggestions and comments about the story topic as a guide to the author.</li> </ul> <p><b>Class 3 &amp; 4</b></p> <ul style="list-style-type: none"> <li>For class 3, pre-service teachers were asked to write a 200-500 word personal narrative about a meaningful experience and bring a typed draft of the story to class.</li> <li>The practitioner and the researcher conferenced with students in class to help students edit and refine their stories</li> <li>Students recorded the narrative during class time in a separate room to provide privacy.</li> </ul> <p>The researcher and the practitioner facilitated the recording process.</p> <p><b>Class 5 &amp; 6 (Held in education college computer lab)</b></p> <p>Practitioner and researcher continued to conference with students to help with story editing and revision.</p> <p>Practitioner and researcher assisted students as they constructed and published digital stories on the computer</p> <p><b>Class 7&amp;8 (Held in classroom environment)</b></p> <ul style="list-style-type: none"> <li>Researcher assisted the practitioner with showing the digital artifacts while the while the practitioner evaluated the digital artifacts as they were shown in class using the project rubric.</li> </ul>	<p><b>Clarification of the research questions</b></p> <ol style="list-style-type: none"> <li>Does engaging in a digital storytelling project result in pre-service teachers valuing digital storytelling as a method to teach the writing process?</li> <li>How does engaging in a digital storytelling project help pre-service teachers to better understand the connection between the planning process in the text-based environment and the planning process in the digital environment?</li> <li>What instructional strategies in a digital storytelling project best enhance pre-service teachers' valuing of digital storytelling as a method to teach the writing process?</li> </ol> <p><b>Writing assignment</b></p> <p>We determined that the writing assignment needed to be more specific. The writing assignment for the second implementation used Carter's (1993) suggestion of a focused writing prompt to write a personal narrative that represents a "well-remembered event" in your life."</p> <p><b>Order of implementation strategies</b></p> <p>Initial focus on digital story examples and technology methods in the prior semester lead students to concentrate on locating images in their photo albums or scrapbooks instead of writing about an important life experience. The course is writing intensive; the initial focus of the project should be on the writing process: prewriting, writing, reflecting, revising, publishing, not on technology.</p> <p><b>Virtual story circle</b></p> <p>The virtual storytelling circle will be used again, but students will be required to post a draft of a completed story instead of a story idea. We came to understand that students must actually construct meaning by posting a completed story. An idea is not a story; there is no commitment or requirement to communicate with an audience when only an idea is posted.</p> <p><b>Peer feedback in virtual story circle</b></p> <p>Review of peer feedback requirements. Students are guided to provide meaningful comments and to pose questions where the meaning of a story is not clear. All comments are to be phrased in a positive, constructive manner.</p> <p><b>Interventionist conferencing model</b></p> <p>Adoption of Atwell's interventionist approach to conferencing with students (Atwell, 1998). This approach is knowledge based; not rule based. The teacher provides expert demonstration and intervenes directly during conferencing, telling writers what works and what does not work; collaborating directly with students to revise their writing.</p>

Second Implementation (Spring 2008)	Rationale for Change in Implementation Strategies for Fall 2008
<p><b>Research questions:</b></p> <ol style="list-style-type: none"> <li>1. Does engaging in a digital storytelling project result in pre-service teachers valuing digital storytelling as a method to teach the writing process?</li> <li>2. How does engaging in a digital storytelling project help pre-service teachers to better understand the connection between the planning process in the text-based environment and the planning process in the digital environment?</li> <li>3. What instructional strategies in a digital storytelling project best enhance pre-service teachers' valuing of digital storytelling as a method to teach the writing process?</li> </ol> <p><b>Writing task:</b> The writing assignment for the second implementation used Carter's (1993) suggestion of a focused writing prompt to write a personal narrative that represents a "well-remembered event" in your life."</p> <p><b>Order of implementation</b></p> <p><b>Class 1</b></p> <ul style="list-style-type: none"> <li>• Practitioner presented a review lesson on literary elements and tied the review of literary elements to the grading rubric for the digital storytelling project</li> <li>• Practitioner reviewed peer feedback requirements using examples of appropriate and inappropriate responses.</li> <li>• Students were guided to provide meaningful comments in the virtual storytelling circle and to pose questions where the meaning of a story is not clear.</li> <li>• Students spent the remainder of the first class pre-writing and conferencing with the practitioner and the researcher about story topics.</li> </ul> <p><b>Before Class 2</b></p> <ul style="list-style-type: none"> <li>• Students were required to post a completed story in the virtual storytelling circle on the class web site and give appropriate feedback to two class members.</li> </ul> <p><b>Class 2 Introduction of Interventionist Conferencing Model (Atwell, 1998)</b></p> <ul style="list-style-type: none"> <li>• Focused on the writing process. The practitioner and the researcher conference with students to help them story editing and revision.</li> </ul> <p><b>Class 3</b></p> <ul style="list-style-type: none"> <li>• Practitioner demonstrated the digital technology required to construct a digital story and provided students with a digital storytelling handout <i>Making a Movie with Windows Movie Maker</i>.</li> <li>• Practitioner showed two well designed digital stories authored by pre-service teachers in the fall 2007 class; one produced with photos, the other with drawings.</li> </ul> <p><b>Classes 4, 5, 6 (Held in college education computing lab)</b></p> <ul style="list-style-type: none"> <li>• Practitioner and researcher conferenced with students about their writing, assisted students with recording the narration and provided support for the construction and publishing of the digital stories.</li> </ul> <p><b>Classes 7&amp;8 (Held in classroom environment)</b></p> <ul style="list-style-type: none"> <li>• Researcher assisted the practitioner with showing the digital artifacts.</li> <li>• Practitioner used the rubric that she explained to students at the start of the project to evaluate the digital artifacts as they were shown in class.</li> </ul>	<p><b>Increased emphasis on story structure</b></p> <p>We recognized a need to model story structure to reinforce elements of plot such as rising action, conflict, resolution or transformation. The practitioner used a modified version of the Freytag model to demonstrate story structure.</p> <p><b>Demonstration of storyboard use</b></p> <p>To encourage student to use the storyboard as a planning tool, the practitioner demonstrated use of a storyboard to design a digital story along with the review of digital technology required to construct a digital story.</p> <p><b>Change in classroom environment</b></p> <p>Due to schedule conflicts, classes 4, 5, 6 were held in the university student computing center, an environment that was outside the college of education and unfamiliar to many students.</p> <ul style="list-style-type: none"> <li>• Students constructed and published digital stories in the lab with support from the practitioner.</li> <li>• Students recorded narration in a library conference room in an adjacent building with support from the researcher and a graduate student.</li> </ul>

Third Implementation (Fall 2008)	Rationale for change in implementation strategies for Spring 2009
<p><b>Writing task:</b> The writing assignment for the second implementation used Carter's (1993) suggestion of a focused writing prompt to write a personal narrative that represents a "well-remembered event" in your life."</p> <p><b>Order of implementation</b></p> <p><b>Class 1</b></p> <p>Practitioner presented a review lesson on literary elements and tied the review to the grading rubric for the digital storytelling project. Practitioner used a modified version of the Freytag plot structure model to graphically illustrate story structure.</p> <p>Practitioner reviewed peer feedback requirements using examples of appropriate and inappropriate responses.</p> <p>Students were guided to provide meaningful comments in the virtual storytelling circle and to pose questions where the meaning of a story is not clear. Students spent the remainder of the first class pre-writing and conferencing with the practitioner and the researcher about story topics.</p> <p><b>Before Class 2</b></p> <ul style="list-style-type: none"> <li>Students were required to post a completed story in the virtual storytelling circle on the class web site and give appropriate feedback to two class members.</li> </ul> <p><b>Class 2</b></p> <p>Focus on the writing process. The practitioner and the researcher conference with students to help them story editing and revision.</p> <p><b>Class 3</b></p> <p>The practitioner presented a lesson on storyboarding to encourage students to use the storyboard template as a planning tool. Students completed story editing and recorded audio.</p> <p><b>Class 4</b></p> <ul style="list-style-type: none"> <li>Practitioner demonstrated the digital technology required to construct a digital story and provided students with a digital storytelling handout <i>Making a Movie with Windows Movie Maker</i>.</li> <li>Practitioner showed two well designed digital stories authored by pre-service teachers in the fall 2007 class; one produced with photos, the other with drawings.</li> </ul> <p><b>Classes 4, 5, 6 (Held in university student computing center lab)</b></p> <ul style="list-style-type: none"> <li>Practitioner conferenced with students about their writing and provided support for the construction and publishing of the digital stories.</li> <li>Researcher assisted students with recording the narration assisted by a graduate student (recording took place in study room in an adjacent library building)</li> </ul> <p><b>Classes 7&amp;8 (Held in classroom environment)</b></p> <ul style="list-style-type: none"> <li>Researcher assisted the practitioner with showing the digital artifacts.</li> <li>Practitioner used the rubric that she explained to students at the start of the project to evaluate the digital stories as they were shown in class.</li> </ul>	<p><b>Addition of story example</b></p> <p>Prior to class 1, students will read a short personal narrative, <i>Eleven</i> by Sandra Cisneros (1991) and complete questions based on the narrative. The story <i>Eleven</i> will be used in class to review literary elements and story structure along with references to the project rubric.</p> <p><b>Inclusion of three structured mini-lessons</b></p> <p>Three mini-lessons designed by the researcher will be presented to support increased student control of the writing process, level of comfort with computers and digital technology, and understanding of image; the three constructs that are identifiable from the factorial analysis of the spring 2008 Likert Scale Attitude Survey post test data as potentially leading to greater valuing of digital story telling as a teaching and learning method by pre-service teachers Mini-lessons are short, focused explanations and demonstrations on a specific topic used to present information and provide opportunities for guided practice.</p> <p><b>1. Mini-lesson: What is a Story?</b></p> <p>Review of literary elements based on the short story <i>Eleven</i> by Sandra Cisneros (1991) and literary elements handout.</p> <p><b>2. Mini-lesson: Using a Storyboard: Linking Narrative to Image to Tell Your Story</b></p> <p><b>3. Mini-lesson: Making a Digital Story in Window Movie Maker.</b></p> <p><b>Storyboard added to the project requirements</b></p> <p>We recognize that the use of a storyboard increases students' understanding of the connection between narrative and image in a digital story.</p> <p><b>Reflection questions added</b></p> <p>To encourage pre-service teacher to reflect on the meaning and purpose of storytelling and future uses of digital storytelling in the classroom, students are requested to respond to questions on the class website.</p> <ol style="list-style-type: none"> <li>What did telling your digital story mean to you?</li> <li>How did engaging in the digital storytelling project change the way you feel about process writing?</li> </ol> <p><b>Class discussion</b></p> <p>The reflection questions are the focus of discussion during the final class period after the digital stories are viewed.</p>

Fourth Implementation (Spring 2009)	Rationale for future changes to implementation strategies
<p><b>Prior to Class 1</b></p> <ul style="list-style-type: none"> <li>Students read the personal narrative <i>Eleven</i> by Sandra Cisneros (1991)</li> <li>Students analyze the story using the literary elements handout.</li> <li>Students should be prepared to discuss the story in class.</li> </ul> <p><b>Writing task:</b> The writing assignment for the second implementation used Carter's (1993) suggestion of a focused writing prompt to write a personal narrative that represents a "well-remembered event" in your life."</p> <p><b>Class 1</b></p> <ul style="list-style-type: none"> <li>Practitioner presents mini-lesson <i>What is a Story?</i></li> <li>Practitioner reviews the elements of a story (definition, characterization, setting, plot, theme, conflict, author's style) based on the personal narrative <i>Eleven</i> by Sandra Cisneros (1991) and relates the literary elements to the project rubric.</li> <li>Practitioner presents the digital storytelling assignment</li> <li>Practitioner reviews peer feedback requirements for meaningful responses on the class web site.</li> <li>Mini-lesson will be available to students on the class website for reference.</li> </ul> <p><b>Before Class 2</b></p> <ul style="list-style-type: none"> <li>Post a draft of your story on the e-Learning virtual storytelling site.</li> <li>Provide meaningful feedback to at least two other students in your class.</li> </ul> <p><b>Class 2</b></p> <ul style="list-style-type: none"> <li>Students are required to bring a print out or hand written copy of the story draft to class.</li> <li>In class writing workshop with students. The practitioner and the researcher will conference with students to support story editing and revision.</li> <li>Additional conferencing is available by e-mail or by appointment with the practitioner and the researcher.</li> </ul> <p><b>Class 3</b></p> <ul style="list-style-type: none"> <li>Students are required to bring a final draft of the story to class.</li> <li>Practitioner presents mini-lesson: <i>Using a Storyboard: Linking Narrative to Image to Tell Your Story</i></li> <li>Practitioner provides students with presentation handout and the storyboard format in both Word and pdf formats. Mini-lesson is available on the class website for reference.</li> <li>In class writing workshop with students. The practitioner and the researcher will conference with students who still need help editing and revising the story.</li> <li>Students are required to use the storyboard to plan the digital story. The storyboard will be turned in with the published digital story.</li> </ul> <p style="text-align: right;">Begin</p> <p>recording the story narrations using Audacity.</p> <p><b>Class 4 (Class meets in the university education computer lab)</b></p> <ul style="list-style-type: none"> <li><b>Practitioner presents mini-lesson: <i>Making a Digital Story in Windows Movie Maker</i></b></li> <li>Practitioner provides students with presentation handout, <i>Making a Digital Story in Windows Movie Maker</i></li> <li>Mini-lesson and handout are available on the class website for reference</li> <li>Practitioner and researcher conference with students, assist with recording the story narration, and provide support with digital story construction and publishing. A graduate student assists with the recording. Support is available for extended hours in the lab and by appointment with the practitioner and the researcher.</li> </ul> <p><b>Class 5 &amp; 6 (Classes meet in the university education computer lab)</b></p> <ul style="list-style-type: none"> <li>Practitioner and researcher conference with students, assist with recording the story narration, and provide support with digital story construction and publishing. A graduate student assists with the recording. Support is available for extended hours in the lab and by appointment with the practitioner and the researcher.</li> <li>Before Class 7, students are required to post responses to two reflection questions in the virtual storytelling circle on the class website.</li> <li>Reflection questions:       <ol style="list-style-type: none"> <li>What did telling your digital story mean to you?</li> <li>How did engaging in the digital storytelling project change the way you feel about teaching the writing process?</li> </ol> </li> </ul> <p><b>Class 7 &amp; 8 (Classes meet in the classroom environment.)</b></p> <ul style="list-style-type: none"> <li>Published digital stories are due at class 7</li> <li>Students turn in a digital story burned to a CD and clearly labeled.</li> <li>Students turn in a folder with a typed copy of the recorded narrative, the completed storyboard, and a copy of the project rubric for evaluation. Include student name on the rubric.</li> <li>View the published digital stories in class. Discuss the reflection responses and the digital storytelling project</li> </ul>	<ol style="list-style-type: none"> <li>Discuss implementation strategies with pre-service teachers as they are introduced so that students understand the strategies from both a procedural and a conditional perspective.</li> <li>Allow an additional class period for students to discuss the digital stories in terms of meaning and application in the classroom.</li> </ol>

## 2-1 Likert Scale Attitude Survey Fall 2007

Please rank each of the flowing statements using the five-point scale, where the value of 1 corresponds to your complete disagreement and 5 refers to complete agreement. Designate the ranking by circling your choice.

Adding images to words helps me to express my ideas when I write.	1	2	3	4	5
Computers are thinking tools.	1	2	3	4	5
Facts are more important than stories.	1	2	3	4	5
I make my point of view clear when I write.	1	2	3	4	5
My first draft of a writing project is my best effort.	1	2	3	4	5
Stories help me to avoid mistakes.	1	2	3	4	5
Writing makes me feel personally empowered.	1	2	3	4	5
Adding digital images to the writing process helps me to think.	1	2	3	4	5
Creating a visual product that I can share with an audience motivates me.	1	2	3	4	5
I enjoy digital technology.	1	2	3	4	5
I plan writing projects carefully.	1	2	3	4	5
Reflecting on my writing helps me to revise.	1	2	3	4	5
Telling stories helps me remember events.	1	2	3	4	5
Computers are effective tools for planning.	1	2	3	4	5
Digital images are a symbolic form of language.	1	2	3	4	5
I enjoy learning new technology applications.	1	2	3	4	5
Knowledge must be verified empirically to be considered true.	1	2	3	4	5
Revision is an important part of the writing process.	1	2	3	4	5
Digital storytelling is a positive learning experience for me.	1	2	3	4	5
Computers are primarily used for information gathering.	1	2	3	4	5
Digital technology is a waste of time in the classroom.	1	2	3	4	5
I have difficulty expressing myself when I write.	1	2	3	4	5
Creating digital stories is entertainment, not education.	1	2	3	4	5
Stories are how I link the present to the past and make sense of the world.	1	2	3	4	5
Writing is an iterative process.	1	2	3	4	5

## 2-2 Likert Scale Attitude Survey Spring 2008

Please rank each of the flowing statements using the five-point scale, where the value of 1 corresponds to your complete disagreement and 5 refers to complete agreement. Designate the ranking by circling your choice.

1	Adding pictures to words helps me to tell a story	1	2	3	4	5
2	A computer is a tool for thinking.	1	2	3	4	5
3	I think facts are more important than stories.	1	2	3	4	5
4	I make my point of view clear when I write.	1	2	3	4	5
5	My first draft of a writing project is my best effort.	1	2	3	4	5
6	I learn from stories.	1	2	3	4	5
7	I express my feelings when I write.	1	2	3	4	5
8	Adding pictures to words makes a story easier to understand	1	2	3	4	5
9	Creating a visual product that I can share with an audience motivates me.	1	2	3	4	5
10	I enjoy using technology.	1	2	3	4	5
11	I use a plan when I write	1	2	3	4	5
12	Reflecting on my writing helps me to revise my work.	1	2	3	4	5
13	Telling stories helps me remember experiences.	1	2	3	4	5
14	Computers are effective tools for teaching and learning	1	2	3	4	5
15	Digital images are a symbolic form of language.	1	2	3	4	5
16	I enjoy learning new technology applications.	1	2	3	4	5
17	Knowledge must be proved for me to believe that it is true.	1	2	3	4	5
18	When I revise my work, my writing improves.	1	2	3	4	5
19	Digital storytelling is a positive learning experience for me.	1	2	3	4	5
20	Computers are primarily for finding information.	1	2	3	4	5
21	Integrating technology into the classroom curriculum is important.	1	2	3	4	5
22	Expressing my thoughts in writing is difficult for me.	1	2	3	4	5
23	Designing a digital story is entertainment, not education.	1	2	3	4	5
24	Stories help me to understand the world.	1	2	3	4	5
25	Writing is an active process that requires revision.	1	2	3	4	5



## 2-3 Likert Scale Attitude Survey Spring 2009

Please rank each of the flowing statements using the five-point scale, where the value of 1 corresponds to your complete disagreement and 5 refers to complete agreement. Designate the ranking by circling your choice.

1	Adding pictures to words helps me to tell a story.	1	2	3	4	5
2	A computer is a tool for thinking.	1	2	3	4	5
3	Writing is an active process that requires revision.	1	2	3	4	5
4	Using digital technology in the curriculum motivates students to learn.	1	2	3	4	5
5	I enjoy writing.	1	2	3	4	5
6	Computers are primarily used for finding information	1	2	3	4	5
7	Planning is an essential part of writing.	1	2	3	4	5
8	Adding pictures to words makes a story easier to understand.	1	2	3	4	5
9	Creating a product that I can share with other motivates me.	1	2	3	4	5
10	I enjoy using computers.	1	2	3	4	5
11	I use a plan when I start a writing project.	1	2	3	4	5
12	Reflecting on my writing helps me to revise my work.	1	2	3	4	5
13	Telling stories helps me remember experiences.	1	2	3	4	5
14	A computer is a tool for organizing knowledge.	1	2	3	4	5
15	Digital images are a symbolic form of language.	1	2	3	4	5
16	I enjoy learning new software applications.	1	2	3	4	5
17	Digital storytelling helps students learn to write.	1	2	3	4	5
18	I feel confident about my ability to write.	1	2	3	4	5
19	Pictures are a form of language.	1	2	3	4	5
20	I plan to use digital technology in a future classroom.	1	2	3	4	5

### 3 Digital Storytelling Project Rubric

Name: \_\_\_\_\_

Title of Digital Story: \_\_\_\_\_

The author participated in the story circle, presented their topic, and provided feedback to peers.

0      1      2

The author establishes and maintains a clear purpose throughout the story.

0      1      2      3      4      5      6      7      8      9      10

The digital story establishes the author's point of view and contributes to the overall theme of the story.

0      1      2      3      4      5

The digital story presents the character(s) with depth. The character(s) supports the author's purpose for the story.

0      1      2      3      4      5

The images create a distinct tone that matches the different parts of the story.

0      1      2      3      4      5

The narrator's voice fits the storyline and helps to draw the audience into the story.

0      1      2      3      4      5

The soundtrack supports the author's point of view and enhances the digital story.

0      1      2      3      4      5

The author's story is concise, told with "economy of detail." It does not seem too long or short.

0      1      2      3      4      5

Evidence of the Writing Workshop Process (Pre-Writing, Drafting, Revising, Editing, Published Document).

0      1      2      3

The author's writing (including language and grammar) support the story by contributing to its clarity, style, and character development (Plot, Characterization, Author's Style).

0      1      2      3      4      5

Total Value: \_\_\_\_\_ of 50 possible points

## 4 Making a Digital Video in Windows Movie Maker

Step 1: Write the script for the story that you want to tell. The script should be about 250-500 words.

Step 2: Use Audacity to record the narration of the script. Export the audio as a WAV file. Save file.  
Audacity (free download): <http://audacity.sourceforge.net/>

Step 3: Select images and crop to 4X3 ratio.

Step 4: Import images, video and audio (narration) into Movie Maker. (Movie Maker is standard on all PCs)

Step 5: Drag and drop the audio file into the audio timeline. Save as a project. Name your project. You must save as a project if you want your images to remain in the timeline when you re-open Movie Maker.

Step 6: Match your images to the recorded narrative on the video timeline. Remember to keep saving!

Add titles and credits by going to Tools. Add transitions between images by going to video transitions, but please remember....transitions are often very distracting. Use ONLY for effect.

Step 7: When you are happy with the product, save as movie file: Choose save to my computer. Select the file where you want to save your video. Select other settings. Choose High Quality Video (NTSC). This takes a few minutes!

Step 7: Open a new Movie Maker file. (Your old images will come in when you open the new file. Delete them. They are still in the saved project. NOW Import the published movie into Movie Maker. Your produced movie will come into Movie Maker in pieces which are numbered chronologically. Place the pieces in the video timeline. Play the video to make sure you have the pieces in the correct order.

Step 8: Import the music. Place the music in the audio timeline. To modify the volume, click on the music in the timeline. You can fade in or out, raise or lower the volume, or mute the music.

To cut a selection, go to clip on the top tool bar. Then choose split. This allows you to select 30 seconds of a song or a specific part of a selection. You can copy and paste a clip along the timeline. To shorten a selection, go to the end and push it back to the point you want.

Step 9: Save the combined project as a movie. Give the movie a new name in case you want to back track and publish as before. Remember: Choose save to my computer. Select the file where you want to save your video. Select other settings. Choose High Quality Video (NTSC). This creates a Windows Media Audio/Video File (WMV). The file will only play in a Windows Media Player.

To create an AVI video file, choose DV-AVI (NTSC). To play the video on an iPod, convert the video to MP4 format. QuickTime 7 Pro will convert the video to iPod format, but there are many other converters available. See: Creating video for iPod:  
<http://www.apple.com/quicktime/tutorials/creatingvideo.html>

## 5 Interview Script

1. What planning process did you use to write your initial story?
2. What was the story that you posted on the Virtual Storytelling Circle?
3. Did your story change as a result of peer feedback in the Virtual Storytelling Circle?  
Did the comments from peers help you to narrow your story focus?
4. How did your story change as a result of interaction with the classroom facilitator?
5. As you developed your digital story, did you use the reading/writing workshop reflective writing process that you learned in Reading 302? (pre-write, draft, revise, edit, and publish)
6. Due to the project, will you use the reading/writing workshop process in future writing assignments?
7. How do you define story? What are elements of narrative structure?
8. What was the conflict in your story?
9. What did telling this story about a meaningful event in your life mean to you?

### LET'S WATCH YOUR STORY.

10. How did the use of a storyboard support your thinking as you combined your narrative with images to create a digital story?
11. How did the addition of digital imagery change the way that you wrote your story?
12. Did the recording the narrative change the way you told your story?
13. Did you have a sense of your own personal voice as you told the story? How did it make you feel about yourself?
14. Had you ever produced a movie before this class? Were you familiar with the Movie Maker and Audacity software used in the project?
15. What was the best part of the digital storytelling experience?
16. What was the most frustrating part of the production process?
17. Did the production of a digital story change the way you feel about your own ability to use technology?
18. Digital storytelling is a process that leads to the production of an artifact that can be shared with others. How did you feel about having others watch your video? What is the potential value of sharing stories in a community of learners?
19. Do you plan to use digital storytelling with future students?
20. Can you give me an example of how you might use technology in your first teaching assignment?

## 6 Experience with Digital Technology Survey

Please respond to the following question by indicating your experience level with digital tasks and applications on a scale of 1-5 with 1 representing no experience and 5 representing a significant level of experience.

Designate your experience level by circling your choice.

- 1 - I have no experience with this digital application or task.
- 2 - I have seen this digital application or task demonstrated, but I don't feel comfortable using it.
- 3 - I sometimes use this digital application or task, but not regularly.
- 4 - I frequently use this digital application or task.
- 5 - I use this digital application or task daily

Word Processing Software	1	2	3	4	5
Spread Sheet Software	1	2	3	4	5
Presentation Software	1	2	3	4	5
Photo Editing Software	1	2	3	4	5
Audio Recording Software	1	2	3	4	5
Video Editing Software	1	2	3	4	5
Digital Camera	1	2	3	4	5
Digital Video Camera	1	2	3	4	5
Digital Scanner	1	2	3	4	5
Digital Music (MP3s, I-Tunes, I Pods)	1	2	3	4	5
Searching the Internet for Images	1	2	3	4	5

**VITA**

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